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DESIGNED BY: R.M. TOWILL CORP.
 MANAGED BY: HWY-DD
 DATE: FEBRUARY 2021
 PHONE: 692-7581

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| DESIGNED BY | DATE |
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| DATE | |
| NO. | |

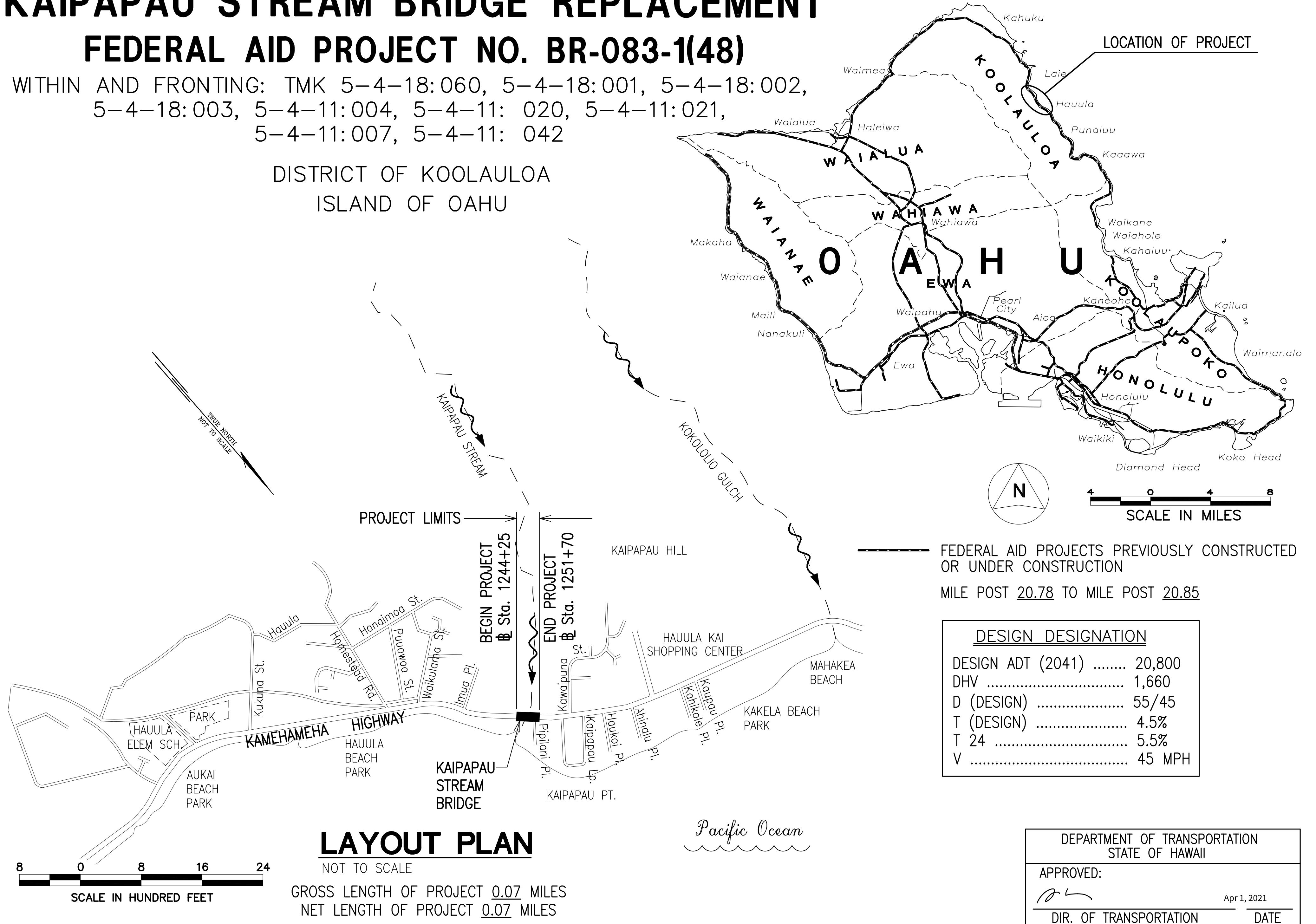
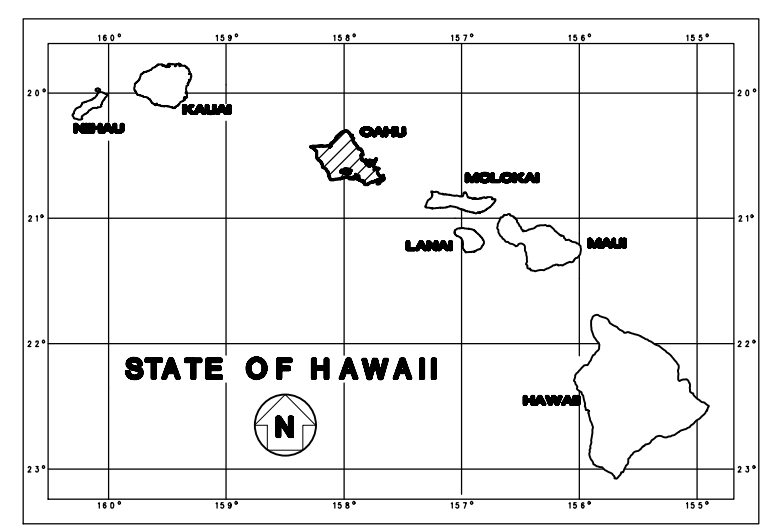
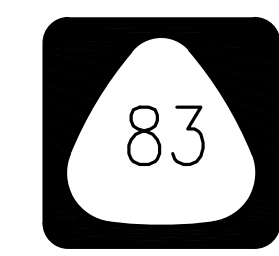
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
 HONOLULU, HAWAII

PLANS FOR
**KAMEHAMEHA HIGHWAY
 KAIPAPAU STREAM BRIDGE REPLACEMENT**
FEDERAL AID PROJECT NO. BR-083-1(48)

WITHIN AND FRONTING: TMK 5-4-18:060, 5-4-18:001, 5-4-18:002,
 5-4-18:003, 5-4-11:004, 5-4-11:020, 5-4-11:021,
 5-4-11:007, 5-4-11:042

DISTRICT OF KOOLAULOA
 ISLAND OF OAHU

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 1 | 161 |



FEDERAL AID PROJECTS PREVIOUSLY CONSTRUCTED OR UNDER CONSTRUCTION
 MILE POST 20.78 TO MILE POST 20.85

| DESIGN DESIGNATION | |
|-------------------------|--------|
| DESIGN ADT (2041) | 20,800 |
| DHV | 1,660 |
| D (DESIGN) | 55/45 |
| T (DESIGN) | 4.5% |
| T 24 | 5.5% |
| V | 45 MPH |

DEPARTMENT OF TRANSPORTATION
 STATE OF HAWAII

APPROVED: _____
 DIR. OF TRANSPORTATION

Apr 1, 2021
 DATE

STANDARD PLANS SUMMARY

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 2 | 161 |

| STANDARD PLAN NO. | TITLE | DATE |
|-------------------|---|----------|
| B-01 ● | Notes & Miscellaneous Details | 05/31/07 |
| B-03 | Backfill Details At Earth Retaining Structures | 05/31/07 |
| B-12 | Prestressed Concrete Piles & Compression Splice Can Details | 05/31/07 |
| B-12A | Prestressed Concrete Piles, Pile & Compression Splice Can Details & Notes | 05/31/07 |
| B-12B | Pile Interaction Diagram | 05/31/07 |
| B-13 | Prestressed Concrete Pile Build-up Details | 05/31/07 |

| STANDARD PLAN NO. | TITLE | DATE |
|-------------------|---|----------|
| D-01 | Cattle Gate | 05/31/07 |
| D-02 ● | Chain Link Fence With Toprail | 05/31/07 |
| D-03 | Chain Link Fence Without Toprail | 05/31/07 |
| D-04 | Wire Fence With Metal Posts | 05/31/07 |
| D-05 ● | Typical Details of Curbs and/or Gutters | 05/31/07 |
| D-06 ● | Typical Detail of Reinforced Concrete Drop Driveway | 05/31/07 |
| D-07 | Centerline and Reference Survey Monuments | 05/31/07 |
| D-08 ● | Street Survey Monument | 05/31/07 |
| D-15 | Concrete Sidewalk | 05/31/07 |
| D-16 | P.C.C. Bus Pad | 05/31/07 |
| D-17 | P.C.C. Bus Pad | 05/31/07 |
| D-18 | P.C.C. Pavement Layout | 05/31/07 |
| D-19 | P.C.C. Pavement w/ Permeable Base Joint Details | 05/31/07 |
| D-20 | P.C.C. Pavement w/ Permeable Base Joint Details | 05/31/07 |
| D-21 | P.C.C. Longitudinal Joint Details | 05/31/07 |
| D-22 | P.C.C. Connection to Curbs and Gutters | 05/31/07 |
| D-23 | Joints | 05/31/07 |

| STANDARD PLAN NO. | TITLE | DATE |
|-------------------|--------------------|----------|
| L-01 | Tree Planting | 08/16/06 |
| L-02 | Tree Planting | 08/16/06 |
| L-03 | Tree Transplanting | 08/16/06 |
| L-04 | Palm Planting | 08/16/06 |
| L-05 | Shrub Planting | 08/16/06 |
| L-06 | Landscape Details | 08/16/06 |
| L-07 | Landscape Details | 08/16/06 |
| L-08 | Landscape Details | 08/16/06 |
| L-09 | Landscape Details | 08/16/06 |
| L-10 | Landscape Details | 08/16/06 |
| L-11 | Planting Notes | 08/16/06 |
| L-12 | Irrigation Details | 08/16/06 |
| L-13 | Irrigation Details | 08/16/06 |
| L-14 | Irrigation Details | 08/16/06 |
| L-15 | Irrigation Details | 08/16/06 |
| L-16 | Irrigation Details | 08/16/06 |
| L-17 | Irrigation Details | 08/16/06 |
| L-18 | Irrigation Details | 08/16/06 |
| L-19 | Irrigation Details | 08/16/06 |
| L-20 | Irrigation Details | 08/16/06 |
| L-21 | Irrigation Details | 08/16/06 |
| L-22 | Irrigation Details | 08/16/06 |
| L-23 | Irrigation Details | 08/16/06 |
| L-24 | Irrigation Notes | 08/16/06 |

| STANDARD PLAN NO. | TITLE | DATE |
|-------------------|--|----------|
| H-01A | Type A Catch Basin | 05/31/07 |
| H-01B | Type B Catch Basin | 05/31/07 |
| H-01C | Type C Catch Basin | 05/31/07 |
| H-01D | Type D Catch Basin | 05/31/07 |
| H-01E | Catch Basin Sections | 05/31/07 |
| H-02A | Type A1 Catch Basin | 05/31/07 |
| H-02B | Type B2 Catch Basin | 05/31/07 |
| H-02C | Type C1 Catch Basin | 05/31/07 |
| H-02D | Type D1 Catch Basin | 05/31/07 |
| H-02E | Catch Basin Section | 05/31/07 |
| H-03 | Type A, B, and C Storm Drain Manhole | 05/31/07 |
| H-04 | Type D Storm Drain Manhole | 05/31/07 |
| H-05 | Typical Reinforcing Details for Drainage Structures | 05/31/07 |
| H-06 | Typical Reinforcing Details for Drainage Structures | 05/31/07 |
| H-07 | Catch Basin and Manhole Castings | 05/31/07 |
| H-08 | Type 1A-9 and 1A-9P Grated Drop Inlet | 05/31/07 |
| H-09 | Type 2A-9 and 2A-9P Grated Drop Inlet | 05/31/07 |
| H-10 | Type A-9 or A-9P Steel Frames | 05/31/07 |
| H-11 | Type A-9 and A-9P Steel Grates | 05/31/07 |
| H-12 | Type 61614P and 1211214P Grated Drop Inlet | 05/31/07 |
| H-13 | Type 61616P and 1211216P Grated Drop Inlet | 05/31/07 |
| H-14 | Type 61214P Grated Drop Inlet | 05/31/07 |
| H-15 | Type 1211214, 1211214P, 1211216, 1211216P Steel Frame and Grates | 05/31/07 |
| H-16 | Type 61614, 61614P, 61616, 61616P Steel Frame and Grates | 05/31/07 |
| H-17 | Type 61214 Steel Frames and Grates | 05/31/07 |
| H-18 | Type 61214P Steel Grates | 05/31/07 |
| H-19 | Type 61614B Steel Frame and Grates | 05/31/07 |
| H-20 | Cement Rubble Masonry Structures | 05/31/07 |
| H-21 | Concrete and Cement Rubble Masonry Structures | 05/31/07 |
| H-22 | Inlet/Outlet Structure | 05/31/07 |
| H-23 | Inlet/Outlet Structure | 05/31/07 |
| H-24 | Flared End Section for Culverts | 05/31/07 |
| H-25 | Flared End Section for Culverts | 05/31/07 |
| H-26 | Concrete Spillway Inlet | 05/31/07 |
| H-27 | Cap Coupling Details Standard Joint | 05/31/07 |
| H-28 | Reinforced Concrete Collar & Jacket | 05/31/07 |
| H-29 | Underdrain Cleanout Steel Frame and Cover | 05/31/07 |
| H-30 | Underdrain Connection to Drainage Structure | 05/31/07 |

| STANDARD PLAN NO. | TITLE | DATE |
|-------------------|---|----------|
| TE-01 ● | Sign Height and Location | 07/11/08 |
| TE-1A ● | Sign Installation | 07/11/08 |
| TE-02A | Galvanized Flanged Channel Sign Post Mounting | 05/31/07 |
| TE-02B | Galvanized Flanged Channel Sign Post Mounting | 05/31/07 |
| TE-02C | Galvanized Flanged Channel Sign Post Mounting | 05/31/07 |
| TE-03A ● | Galvanized Square Tube Sign Post Mounting | 05/31/07 |
| TE-03B ● | Galvanized Square Tube Sign Post Mounting | 05/31/07 |
| TE-04 ● | Regulatory Signs | 07/11/08 |
| TE-05 ● | Warning Signs | 07/11/08 |
| TE-06 | Miscellaneous Signs | 07/11/08 |
| TE-07 ● | Construction Signs | 07/11/08 |
| TE-08 | Miscellaneous Intersection Signs | 07/11/08 |

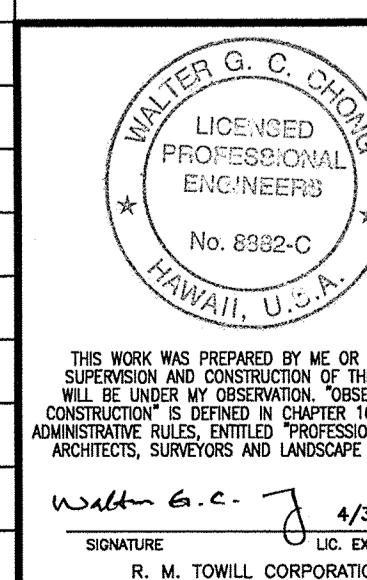
| STANDARD PLAN NO. | TITLE | DATE |
|-------------------|--|----------|
| TE-09 | Bike Route Sign & Supplementary Plates | 07/11/08 |
| TE-10 | Interstate Route Marker | 07/11/08 |
| TE-11 | State Route Marker and Auxiliary Markers | 07/11/08 |
| TE-12 | State Route Marker and Border Detail for Guide Signs | 07/11/08 |
| TE-12A | Route Sign Assemblies | 07/11/08 |
| TE-13 | Street Name Sign On Mast Arm | 07/11/08 |
| TE-14 | Miscellaneous Reflector Markers | 07/11/08 |
| TE-15 | Object Markers | 07/11/08 |
| TE-16 | Mile Posts | 07/11/08 |
| TE-17A | Cantilever Overhead Sign Elevation & Details | 05/31/07 |
| TE-17B | Cantilever Sign Frame Detail and Section | 05/31/07 |
| TE-17C | Cantilever Sign Frame Detail | 05/31/07 |
| TE-17D | Cantilever Sign Frame Section | 05/31/07 |
| TE-17E | Cantilever Sign Frame Details | 05/31/07 |
| TE-18A | Two Post Overhead Sign Frame Elevations | 05/31/07 |
| TE-18B | Two Post Sign Framing Plan Section | 05/31/07 |
| TE-18C | Two Post Sign Framing Sections and Details | 05/31/07 |
| TE-18D | Two Post Sign Frame Details | 05/31/07 |
| TE-18E | Two Post Sign Frame Details | 05/31/07 |
| TE-19A | Overhead Sign Framing Schedule | 05/31/07 |
| TE-19B | Sign Post Drilled Shaft Foundation | 05/31/07 |
| TE-19C | Spread Footing | 05/31/07 |
| TE-19D | Sign Frame Foundation Schedule | 05/31/07 |
| TE-19D.1 | Sign Frame Foundation Schedule | 05/31/07 |
| TE-19D.2 | Sign Frame Foundation Schedule | 05/31/07 |
| TE-19D.3 | Sign Frame Foundation Schedule | 05/31/07 |
| TE-19D.4 | Sign Frame Foundation Schedule | 05/31/07 |
| TE-19D.5 | Sign Frame Foundation Schedule | 05/31/07 |
| TE-19E | Anchorage Details | 05/31/07 |
| TE-19F | Anchorage Details | 05/31/07 |
| TE-19G | Miscellaneous Sign Frame Details | 05/31/07 |
| TE-19H | Luminaire Walkway Support | 05/31/07 |
| TE-19J | Fixed Message Luminaire Support | 05/31/07 |
| TE-19K | Miscellaneous Sign Details | 05/31/07 |
| TE-19L | Miscellaneous Sign Details | 05/31/07 |
| TE-19M | Miscellaneous Sign Frame Details | 05/31/07 |
| TE-20 | Supports for Ground Mounted Guide Sign | 05/31/07 |
| TE-20A | Supports for Ground Mounted Guide Sign | 05/31/07 |
| TE-20B | Supports for Ground Mounted Guide Sign | 05/31/07 |
| TE-20C | Supports for Ground Mounted Guide Sign | 05/31/07 |
| TE-21A | Sign Breakaway Mounts | 05/31/07 |
| TE-21B | Sign Breakaway Mounts | 05/31/07 |
| TE-22 | Laminated Aluminum Sign Panels (Overhead) | 05/31/07 |
| TE-23 | Laminated Aluminum Sign Panels (Ground Mounted) | 07/11/08 |
| TE-24 | Solid Aluminum Extruded Sign Panel and Accessory Details | 05/31/07 |
| TE-25 | Guide Signs Luminaire Mountings | 05/31/07 |
| TE-26 ● | Raised Pavement Markers and Striping | 07/11/08 |
| TE-27 ● | Raised Pavement Markers and Striping | 07/11/08 |
| TE-28 | Entrance and Exit Pavement Markings | 07/11/08 |
| TE-28A ● | Miscellaneous Pavement Markings | 07/11/08 |
| TE-29 ● | Pavement Arrows and Symbols | 07/11/08 |
| TE-30 ● | Pavement Alphabets, Numbers & Symbols | 07/11/08 |
| TE-31 ● | Pavement Alphabets, Numbers & Symbols | 07/11/08 |

| STANDARD PLAN NO. | TITLE | DATE |
|-------------------|---|----------|
| TE-32 | Type I & II Traffic Signal System Misc. Details | 05/31/07 |
| TE-33 | Type II Traffic Signal System | 08/16/06 |
| TE-33A.1 | Type II Traffic Signal Standard | 05/31/07 |
| TE-33A.2 | Type II Traffic Signal Standard | 05/31/07 |
| TE-34 | Loop Detector Details | 07/11/08 |
| TE-35 | Loop Detectors & Duct Details | 07/11/08 |
| TE-36 | Traffic Signal Details | 07/11/08 |
| TE-37 | Pullbox & Cover Details | 07/11/08 |
| TE-37A | Type "A" Traffic Pullbox | 05/31/07 |
| TE-37B | Type "A" Traffic Pullbox Reinforcing | 05/31/07 |
| TE-37C | Type "B" Traffic Pullbox | 05/31/07 |
| TE-37D | Type "B" Traffic Pullbox Reinforcing | 05/31/07 |
| TE-37E | Type "B" Traffic Pullbox Foundation | 05/31/07 |
| TE-37F | Type "C" Traffic Pullbox | 05/31/07 |
| TE-37G | Type "C" Traffic Pullbox Reinforcing | 05/31/07 |
| TE-37H | Type "C" Traffic Pullbox Foundation | 05/31/07 |
| TE-37J | Traffic Pullbox Cover and Details | 05/31/07 |
| TE-38 | Type III Traffic Signal Standard | 05/31/07 |
| TE-38A.1 | Type III Traffic Signal Standard | 05/31/07 |
| TE-38A.2 | Type III Traffic Signal Standard | 05/31/07 |
| TE-39 | Metal Guardrail Connection to Concrete Barrier | 07/11/08 |
| TE-40 | Concrete Barrier Transition | 05/31/07 |
| TE-40A | Concrete Barrier Transition Sections | 05/31/07 |
| TE-41 | Guardrail Type 4 (Rigid Barrier) | 05/31/07 |
| TE-42 ● | Portable Concrete Barrier | 05/31/07 |
| TE-43 ● | Portable Concrete Barrier | 05/31/07 |
| TE-44 | Guardrail Type 4 Miscellaneous Details | 07/11/08 |
| TE-45 | Barricades | 07/11/08 |
| TE-46 | Delineation & Pavement Markings At Narrow Bridges | 07/11/08 |
| TE-47 ● | Highway Light Standard | 05/31/07 |

Notes:

- Standard Plans applicable to this project are indicated by a "●" next to the Standard Plan No. (D-07 ●)
- TE-42 & TE-43 are for reference only if contractor uses portable concrete barriers manufactured before December 31, 2019.

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| DESIGNED BY | DATE |
| DRAWN BY | |
| CHECKED BY | |
| IN CHARGE | |
| NO. _____ | |



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD PLANS SUMMARY

Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

Scale: As Noted

Date: February 2021

SHEET No. C-1 OF SHEETS

GENERAL NOTES

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 3 | 161 |

- The scope of work for this project includes constructing a new bridge across the Kaipapau Stream; installing temporary diversion road, temporary prefabricated steel beam bridge, walls and fences; channel shaping; shoulder improvements, installing bridge approaches; pavement markings, striping and signing; guardrails and end treatments and relocating water and utility lines.
- The Contractor is reminded of the requirements of Subsection 105.16 – Subcontracts, which requires him to perform work amounting to not less than 30 percent of the total contract cost less deductible items. Noncompliance with this Subsection may be grounds for rejection of bid.
- The Contractor’s attention is directed to the following sections of the Special Provisions: Subsection 104.09 – Maintenance of Traffic; Subsection 104.11 – Utilities and Services; Subsection 107.06 – Contractor Duty Regarding Public Convenience; and Subsection 645 – Work Zone Traffic Control.
- At the end of each day’s work, the Contractor shall remove all equipment and other obstructions and provide signage to permit free and safe passage of public traffic.
- The existence and location of underground utilities, manholes, monuments, buried railroad tracks and concrete pavements, and other structures as shown on the plans are from the latest available data but the accuracy is not guaranteed. The encountering of other obstacles during the course of work is possible. The Contractor shall make an independent check on the ground by probing and/or with the various utility companies and governmental agencies to verify the exact locations and depths of the existing utilities and obstructions. The Contractor shall exercise proper care in excavating and cold planing in the area. Whenever connections of new utilities to existing utilities are shown on the plans, the Contractor shall expose the existing lines at the proposed connections to verify their locations and depths prior to excavating for the new lines. The Contractor shall be held liable for any damages incurred to the existing facilities and/or improvements as a result of their operations.
- The Contractor shall notify the Engineer in writing, at least three (3) weeks prior to starting operations.
- Dressing of shoulder, sidewalk and bus turnout shall consist of clearing, grubbing, grading, reshaping and compacting the unpaved shoulders with suitable material as shown on the plans and/or as directed by the Engineer. This work shall be considered incidental to the various contract items.
- Existing drainage system will be functional at all times during construction. The Contractor shall furnish materials, equipment, labor, tools and incidentals necessary to maintain drainage flow. This includes all drainage runoff entering and leaving the project. This work shall be considered incidental to various contract items.
- The Contractor shall notify in writing the Oahu Transit Services, Inc., Roads Supervisor office, 811 Middle St., Honolulu, HI 96819 (848-4571) seven (7) days prior to the start of construction.
- The contractor shall provide vehicular access to and from all existing side streets and driveway at all times.
- Contractor shall dispose of all construction debris at a state approved dump site.
- The Contractor shall be held liable for any damages incurred to the existing landscaping as a result of their operations.
- After the project is completed, the Contractor shall restore landscaping in the project limits to pre-construction condition or better.
- All existing utilities, whether or not shown on the plans, shall be protected at all times by the Contractor during construction unless specified on the plans as abandoned. Any damage to the existing utilities shall be repaired and paid for by the Contractor.

- Unless relocation is called for on the plans, existing utilities shall remain in service and in place at all times. If relocation of the existing utilities is required for the Contractor’s convenience, interruption of service shall be kept to a minimum and shall be done at the Contractor’s expense only with the prior written approval of the affected utility company and Engineer.
- The Contractor shall field verify the operational status of all existing utilities to be removed or abandoned in place. Any discrepancy shall be brought to the attention of the Engineer.
- The Contractor shall verify all dimensions and details shown on the drawings prior to the start of construction. Any discrepancy shall be immediately brought to the attention of the Engineer.
- Construction outside the Hawaii Department of Transportation (HDOT) right-of-way is subject to permission of the affected owner as verified by HDOT.
- For structures to be abandoned in place, the top 4’ below finish grade shall be removed and backfilled with approved material.
- All construction work shall be done in accordance with the standards and specifications of the State Department of Transportation as amended, unless otherwise specified by the contract plans and specifications.
- The Contractor shall notify the Engineer and contact the State Historic Preservation Division upon uncovering any potential historical artifacts or items of archaeological significance. See Section 107.13 in the 2005 State Standard Specifications.
- The existing improvements on the premises and in adjacent area that are not to be removed shall be preserved and protected. Any and all damages resulting from the Contractor’s construction operations shall be replaced and repaired to original condition, to the satisfaction of the owner at no cost to the State.
- For benchmark, see sheet C-9.
- All drainage structures shall be marked as directed by the Engineer.
- Azimuths and coordinates are referred to Government Survey Triangulation Station “Kaipapau”. Topographic survey done by R.M. Towill Corp. on 7/14/03 and 12/4/09. Topographic survey done to National Mapping Standards.
- Elevations shown on these plans are referenced to Mean Sea Level (MSL).
- The Contractor shall adjust centerline and reference survey monuments to the finished pavement grade. This work shall be considered incidental to superpave asphalt concrete pavement and will not be paid for separately.
- All steel plates shall be flat and have a non-skid surface and shall emit no objectionable noise when crossed. The contractor shall safely maintain non-skid surface plate at all times. The work material shall be considered incidental to Traffic Control.
- The Contractor shall coordinate, if applicable, construction of electrical, telephone, cable television, water, and sewer relocation work with Hawaiian Electric Company, Hawaiian Tel Com, Oceanic Cable, Board of Water Supply, and Department of Environmental Services, respectively. Coordination shall be considered incidental to roadway excavation work.

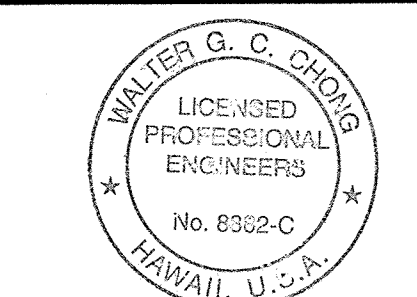
- Stream topography continually changes. The contractor shall conduct a pre-bid stream survey and adjust construction accordingly. Any changes as a result of changes in stream topography shall be considered incidental to various items of work.
- The contractor shall probe/excavate to verify the exact location of the 16-inch centerline pole support system within the project limits prior to any construction. The contractor shall survey the location of the waterline support system and map the waterline support system. The waterline support system shall be superimposed on the construction documents. The contract shall adjust accordingly to account for the actual location of the 16-inch waterline structural support system which includes piles, concrete cradles, concrete reaction blocks and appurtenances. Any adjustments to the contract and result of the 16-inch waterline support system will be considered incidental to various items of work.
- The Contractor shall be advised of the following concurrent projects during this project’s duration:
 - Kamehameha Highway Rehabilitation, Vicinity of Kapuhi Street to Dairy Road
 - Kamehameha Highway Resurfacing, Kamananui Road and Wilikina Dr., Vicinity of Weed Circle to Interstate Route H-2

The Engineer will inform the Contractor when more information is known about the concurrent projects. The Contractor shall adjust trucking routes and loads accordingly. This cost shall be considered incidental to various Contract Items.

The Contractor shall be advised of the legal size and weight limits for vehicles and equipment in HRS 291-34 and HRS 291-35. In compliance with the law, the operation or transport of any equipment or truck which exceeds these limits shall apply for an Oversized and/or Overweight Vehicle permit through the Department of Transportation in accordance with HRS 291-36.

PUBLIC HEALTH, SAFETY AND CONVENIENCE NOTES:

- The Contractor shall observe and comply with all Federal, State and local laws required for the protection of public health and safety and environmental quality.
- The Contractor, at his own expense, shall keep the project and its surrounding areas free from dust nuisance. The work shall be in conformance with the Air Pollution Standards of the State Department of Health. The State may require supplementary measures as necessary.

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|  <p>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. I AM A MEMBER OF THE HAWAIIAN SOCIETY OF PROFESSIONAL ENGINEERS. ADMINISTRATIVE RULES, ENTITLED "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS."</p> <p>Walter G. C. Chong R. M. TOWILL CORPORATION</p> | <p>STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION</p> <p>GENERAL NOTES – 1</p> <p><i>Kamehameha Highway Kaipapau Stream Bridge Replacement Federal Aid Project No. BR-083-1(48)</i></p> <p>Scale: As Noted Date: February 2021</p> |
| | <p>SHEET No. C-2 OF SHEETS</p> |

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SECTION 7 NOTES

1. According to National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Kaipapau Stream Bridge project appears to take place near a beach with a known Hawaiian monk seal haul-out-zone. Hawaiian monk seals are protected under the Marine Mammal Protection Act and the Endangered Species Act. Contractor shall employ good "best management practices" during construction to ensure debris (plastics, etc that could entangle animals if washed downstream), and pollution runoff is controlled.
2. Contractor shall contact Mr. David Schofield, the Marine Mammal Response Coordinator for National Marine Fisheries Service Protected Resources Division at 808-725-5161 to schedule a protected wildlife briefing between Mr. Schofield and the construction crew.

SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT NOTES

1. State Historic Preservation Division required that Contractor shall photograph the Kaipapau Stream Bridge before demolition. These photographs may be in digital or print format. A copy of the photograph shall be provided to the Engineer.
2. Contractor is required to conduct archaeological monitoring for any planned ground disturbance of any potentially sensitive area of the Area of Potential Effect.
3. A human burial was previously identified on the makai side of Kamehameha Highway, approximately 20 feet north of the intersection with Pipilani Place, just north (outside) of the Kaipapau Stream Bridge Replacement project area. The proximity of this burial indicates a heightened probability of additional burials in this area. In the event of the inadvertent discovery of human skeletal remains or any other significant finds, all work in the immediate vicinity should stop. Contractor shall immediately notify State Historic Preservation Division at 808-692-8015 of the findings.

FISH AND WILDLIFE NOTES FOR OUT OF WATER WORK

1. Any increase in the use of night-time lighting, particularly during each year's peak fallout period (September 15 through December 15) could result in additional seabird injury or mortality. Contractor shall minimized impacts to seabirds by shielding outdoor lights to the maximum extent possible, eliminating night time construction from September 15 through December 15 and providing all project staff and residents with information about seabird fallout.
2. Contractor shall shield all lights, including street lights so the bulb can only be seen from below and use the lowest wattage bulbs possible.
3. Outdoor lighting for construction work shall have automatic motion sensor switches and controls installed; or lights shall be turned off when human activity is not occurring in the lighted area.

GRADING NOTES

1. All grading work shall be done in accordance with State of Hawaii Standard Specifications for Road and Bridge Construction, 2005.
2. No contractor shall perform any grading operation so as to cause falling rocks, soil or debris in any form to fall, slide or flow onto adjoining properties, streets or natural watercourses. Should such violations occur, the Contractor may be cited and the Contractor shall immediately make all remedial actions necessary.
3. The Contractor, at the Contractor's own expense, shall keep the project area and surrounding area free from dust nuisance.
4. The underground pipes, cables or ductlines known to exist by the Design Engineer from his/her search of records are indicated on the plans. The Contractor shall verify the locations and depths of the facilities and exercise proper care in excavating in the area. Wherever connections of new utilities are shown on the plans, the Contractor shall expose the existing lines at the proposed connections to verify their locations and depths prior to excavation for the new lines.
5. Prevent damage to the cut face of an excavation or the sloped surfaces of a fill. Furthermore, sediment-laden runoff shall not leave the site.
6. All slopes and exposed areas shall be sodded, planted, or hydromulched, as soon as practicable, but no later than the end of the next work day, following the day when the earth-disturbing activities have temporarily or permanently ceased on any portion of the site. Planting shall not be delayed until all grading work has been completed. Grading to final grade shall be continuous, and any area within which work has been interrupted or delayed shall be planted. Earth-disturbing activities have permanently ceased when clearing and excavation within any area of the construction site that will not include permanent structures has been completed. Earth-disturbing activities have temporarily ceased when clearing, grading, and excavation within any area of the site that will not include permanent structures will not resume for a period of 14 or more calendar days, but such activities will resume in the future. For construction areas discharging into waters not impaired for nutrients or sediments, complete initial stabilization within 14 calendar days after the temporary or permanent cessation of earth-disturbing activities. For construction areas discharging into nutrient or sediment impaired waters, complete initial stabilization within 7 calendar days after the temporary or permanent cessation of earth-disturbing activities. For projects without an NPDES Permit for Construction activities, complete initial stabilization within 14 calendar days after the temporary or permanent cessation of earth-disturbing activities.

GRADING NOTES (CONT.)

7. Fills on slopes steeper than 5:1 shall be keyed.
8. No grading work shall be done on Saturdays, Sundays and holidays at any time without prior notice and acceptance by the Engineer, provided such grading work is also in conformance with the community noise control standards contained in the Hawaii Administrative Rules, Title 11, Chapter 46, "Community Noise Control."
9. The limits of the area to be graded shall be flagged before the commencement of the grading work.
10. All grading operations shall be performed in conformance with the applicable provisions of the water quality and water pollution control standards contained in Hawaii Administrative Rules, Title 11, Chapter 54, "Water Quality Standards," and Title 11, Chapter 55, "Water Pollution Control" and if applicable, the NPDES permit for the project.
11. The measures to control erosion and other pollutants shall be in place before any earth-moving phase of the grading is initiated.
12. Temporary erosion controls shall not be removed before permanent erosion controls are in-place and established.
13. Temporary erosion control procedures shall be submitted to the Engineer for approval prior to application for permit.
14. If the grading work involves contaminated soil, then all grading work shall be done in conformance with applicable State and Federal requirements.
15. Building permit for retaining walls shall be obtained from the Department of Public Works prior to commencement of grading work on site.
16. In the event any artifacts or human remains are uncovered during construction operations, the contractor shall immediately suspend work and notify the Island of Hawaii District office ((808) 933-8866), the Island of Hawaii Police Department, the State Department of Land and Natural Resources-Historic Preservation Division (808-933-7650).
17. Non-compliance to any of the above requirements shall mean immediate suspension of all work, and remedial work shall commence immediately. All costs incurred shall be billed to the violator. Furthermore, violators shall be subjected to administrative, civil and/or criminal penalties.
18. Place topsoil prior to placement of erosion control matting, in accordance with the requirements of Section 617-Planting Soil, and Section 716-Geotextiles.
19. Any loose/soft soils encountered shall be removed and backfilled with proper compacted fill prior to mass grading.

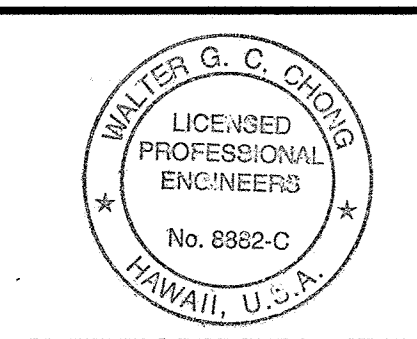
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NATIONAL MARINE FISHERIES SERVICE (NMFS) PROTECTED RESOURCES DIVISION, FISH & WILDLIFE NOTES, BEST MANAGEMENT PRACTICES (BMPs) FOR IN-STREAM WATER WORK

NMFS Protected Resources Division recommends implementation of the following BMPs to reduce potential adverse affects on protected marine species. These BMPs are in no way intended to supersede or replace measures required by any other agency including, but not limited to the ACOE, USFWS, USEPA, or NMFS Habitat Conservation Division. BMPs shall be considered incidental to the various items of work.

1. Constant vigilance shall be kept for the presence of Endangered Species Act (ESA)-listed marine species during all aspects of the proposed action, particularly in-water activities such as deploying the buoys' anchors and mooring lines, boat operations, or diving.
 - a. The project manager shall designate a competent observer to survey the marine areas adjacent to the proposed action for ESA-listed marine species.
 - b. Surveys shall be made prior to the start of work each day, and periodically during the day, including prior to resumption of work following any break of more than one half hour.
 - c. All in-water work will be postponed or halted when ESA-listed marine species are within 50 feet of the proposed work, and will only begin/resume after the animals have voluntarily departed the area. If ESA-listed marine species are noticed after work has already begun, that work may continue only if there is no way for the activity to adversely affect the animal(s).
2. No contamination of the marine environment will result from project-related activities.
 - a. A contingency plan to control petroleum products accidentally spilled during the project will be developed. Appropriate materials to contain and clean potential spills will be stored at the work site, and be readily available.
 - b. All project-related materials and equipment placed in the water will be free of pollutants. The project manager and heavy equipment operators will perform daily pre-work equipment inspections for cleanliness and leaks. All heavy equipment operations will be postponed or halted should a leak be detected, and will not proceed until the leak is repaired and equipment cleaned.
 - c. A plan will be developed to prevent debris and other wastes from entering or remaining in the marine environment during the project.

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Wai-ter G. C. Chong
4/20/22
R. M. TOWILL CORPORATION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GENERAL NOTES - 2

*Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)*

Scale: As Noted Date: February 2021

WATER POLLUTION AND EROSION CONTROL NOTES

A. GENERAL:

1. See Special Provisions Section 209 – Water Pollution and Erosion Control. Section 209 describes but is not limited to: submittal requirements; scheduling of a water pollution and erosion control conference with the Engineer; construction requirements; method of measurement; and basis of payment. In addition, Appendix A lists potential pollutant sources and corresponding BMPs used to mitigate the pollutants.
2. Follow the guidelines in the current HDOT Construction Best Management Practices Field Manual in developing, installing and maintaining the Best Management Practices (BMP) for the project. For any conflicting requirements between the Manual and applicable bid documents, the applicable bid documents will govern. Should a requirement not be clearly described within the applicable bid documents, the Contractor shall notify the Engineer immediately for interpretation. For the purposes of clarification under Note A.2, "applicable bid documents" include the construction plans, standard specifications, Special Provisions, Permits, and the Storm Water Pollution Prevention Plan (SWPPP) when applicable.
3. Follow the guidelines in the Honolulu's City & County "Rules Relating to Soil Erosion Standards and Guidelines" along with applicable Soil Erosion Guidelines for projects on Maui, Molokai, Kauai, and Hawaii.
4. The Engineer may assess liquidated damages of up to \$27,500 for non-compliance of each BMP requirement and each requirement stated in Section 209 and special provisions, for every day of non-compliance. There is no maximum limit on the amount assessed per day.
5. The Engineer will deduct the cost from the progress payment for all citations received by the Department for non-compliance, or the Contractor shall reimburse the State for the full amount of the outstanding cost incurred by the State.
6. If necessary, install a rain gage prior to any field work including the installation of any site-specific best management practices. The rain gage shall have a tolerance of at least 0.05 inches of rainfall. Install the rain gage on the project site in an area that will not deter rainfall from entering the gage opening. Do not install in a location where rain water may splash into rain gage. The rain gage installation shall be stable and plumbed. Do not begin field work until the rain gage is installed and site-specific best management practices are in-place.
7. Submit Site-Specific BMP Plan to the Engineer along with a completed Site-Specific BMP Review Checklist within 30 calendar days of contract execution. The Site-Specific BMP Review Checklist may be obtained from <http://www.stormwaterhawaii.com>.

B. WASTE DISPOSAL:

1. **Waste Materials:** Collect and store all waste materials in a securely lidded metal dumpster or roll off container with cover to keep rain out or loss of waste during windy conditions. The dumpster shall meet all local and State solid waste management regulations. Deposit all trash and construction debris from the site in the dumpster. Empty the dumpster weekly or when the container is two-thirds full, whichever is sooner. Do not bury construction waste materials onsite. The Contractor's supervisory personnel shall be instructed regarding the correct procedure for waste disposal. Post notices stating these practices in the office trailer, on a weatherproof bulletin board, or other accessible location acceptable to the Engineer. The Contractor shall be responsible for seeing that these procedures are followed. Submit the Solid Waste Disclosure Form for Construction Sites to the Engineer within 30 calendar days of contract execution. Provide a copy of all the disposal receipts from the facility permitted by the Department of Health to receive solid waste to the Engineer monthly. This should also include documentation from any intermediary facility where solid waste is handled or processed.
2. **Hazardous Waste:** Dispose all hazardous waste materials in the manner specified by local or State regulations and by the manufacturer. The Contractor's site personnel shall be instructed in these practices and shall be responsible for seeing that these practices are followed.

WATER POLLUTION AND EROSION CONTROL NOTES (CONT.)

3. **Sanitary Waste:** Collect all sanitary waste from the portable units a minimum of once per week, or as required. Position sanitary facilities where they are secure and will not be tipped over or knocked down.
- C. **EROSION AND SEDIMENT CONTROL INSPECTION AND MAINTENANCE PRACTICES:**
 1. For projects with an NPDES Permit for Construction Activities, inspect at the following intervals. For construction areas discharging to nutrient or sediment impaired waters, inspect all control measures at least once each week and within 24 hours of any rainfall event of 0.25 inches or greater within a 24 hour period. For construction areas discharging to waters not impaired for nutrient or sediments, inspect all control measures weekly. Inspections are only required during the project's normal working hours. The discharge point water classification may be found in the SWPPP.
 2. For projects without an NPDES Permit for Construction Activities, inspect all control measures weekly.
 3. Maintain all erosion and sediment control measures in good working order. If repair is necessary, initiate repair immediately and complete by the close of the next work day if the problem does not require significant repair or replacement, or if the problem can be corrected through routine maintenance. When installation of a new erosion or sediment control or a significant repair is needed, install the new or modified control or complete the repair no later than 7 calendar days from the time of discovery. "Immediately" means the Contractor shall take all reasonable measures to minimize or prevent discharge of pollutants until a permanent solution is installed and made operational. If a problem is identified at a time in the day in which it is too late to initiate repair, initiation of repair shall begin on the following work day.
 4. Remove built-up sediment from silt fence when it has reached one-third the height of the fence. Remove sediment from other perimeter sediment control devices when it has reached one-half the height of the device.
 5. Inspect silt screen or fence for depth of sediment, tears, to verify that the fabric is securely attached to the fence posts or concrete slab and to verify that the fence posts are firmly in the ground. Inspect and verify the bottom of the silt screen is buried a minimum of 6 inches below the existing ground.
 6. Inspect temporary and permanent seeding and planting for bare spots, washouts and healthy growth.
 7. Complete and submit to the Engineer a maintenance inspection report within 24 hours after each inspection.
 8. Provide a stabilized construction entrance at all points of exit onto paved roads to reduce vehicle tracking of sediments. Include stabilized construction entrance in the Water Pollution, Dust, and Erosion Control submittals. Minimum length should be 50 feet. Minimum width should be 30 feet. Minimum depth should be 12 inches or as recommended by the soils engineer and underlain with geo-textile fabric. If minimum dimensions cannot be met, provide other stabilization techniques that remove sediment prior to exit. Clean the paved street adjacent to the site entrance daily or as required to remove any excess mud, cold-planed materials, dirt or rock tracked from the site. Do not hose down the street without containing or vacuuming wash water. Cover dump trucks hauling material from the construction site with a tarpaulin. Remove sediment tracked onto the street, sidewalk, or other paved area by the end of the day in which the track-out occurs.
 9. Include designated Concrete Washout Area(s) in the Water Pollution, Dust, and Erosion Control submittals.
 10. Submit the name of a specific individual designated responsible for inspections, maintenance and repair activities and filling out the inspection and maintenance report.
 11. Personnel selected for the inspection and maintenance responsibilities shall receive training from the Contractor. They shall be trained in all the inspection and maintenance practices necessary for keeping the erosion and sediment controls used onsite in good working order.

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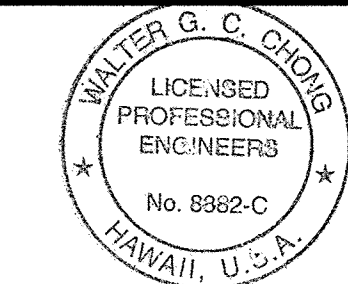
WATER POLLUTION AND EROSION CONTROL NOTES (CONT.)

12. Contain, remove, and dispose slurry generated from saw cutting of pavement in accordance with approved BMP practices. Do not allow discharge into the drainage system or State waters.
13. For projects with an NPDES Permit for Construction Activities, immediately initiate stabilizing exposed soil areas upon completion of earth-disturbing activities for areas where earth-disturbing activities have permanently or temporarily ceased. Earth-disturbing activities have permanently ceased when clearing and excavation within any area of the construction site that will not include permanent structures has been completed. Earth-disturbing activities have temporarily ceased when clearing, grading, and excavation within any area of the site that will not include permanent structures will not resume (i.e., the land will be idle) for a period of 14 or more calendar days, but such activities will resume in the future. For construction areas discharging into waters not impaired for nutrients sediments, complete initial stabilization within 14 calendar days after the temporary or permanent cessation of earth-disturbing activities. For construction areas discharging into nutrient or sediment impaired waters, complete initial stabilization within 7 calendar days after the temporary or permanent cessation of earth-disturbing activities. Classification of water at the discharge point may be found in the SWPPP.
14. For projects without an NPDES Permit for Construction Activities, complete initial stabilization within 14 calendar days after the temporary or permanent cessation of earth-disturbing activities.

D. GOOD HOUSEKEEPING BEST MANAGEMENT PRACTICES:

1. **Materials Pollution Prevention Plan**
 - a. Applicable materials or substances listed below are expected to be present onsite during construction. Other materials and substances not listed below shall be added to the inventory.

| | |
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| Concrete | Cleaning Solvents |
| Detergents | Wood |
| Paints (enamel and latex) | Masonry Block |
| Metal Studs | Herbicides and Pesticides |
| Tar | Curing Compounds |
| Fertilizers | Adhesives |
| Petroleum Based Products | |
 - b. Use Material Management Practices to reduce the risk of spills or other accidental exposure of materials and substances to storm water runoff. Make an effort to store only enough product as is required to do the job.
 - c. Store all materials stored onsite in a neat, orderly manner in their appropriate containers and if possible under a roof or other enclosure.
 - d. Keep products in their original containers with the original manufacturer's label.

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|  <p>WALTER G. C. CHIOLES LICENSED PROFESSIONAL ENGINEER No. 8882-C HAWAII, U.S.A.</p> <p><small>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. OBSERVATION OF CONSTRUCTION IS DEFINED IN CHAPTER 16-115, HAWAII ADMINISTRATIVE RULES, ENTITLED "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS."</small></p> <p>WALTER G. C. CHIOLES 4/30/22 SIGNATURE U.C. EXPIRATION R. M. TOWILL CORPORATION</p> | <p>STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION</p> <p>WATER POLLUTION & EROSION CONTROL NOTES – 1</p> <p>Kamehameha Highway Kaipapau Stream Bridge Replacement Federal Aid Project No. BR-083-1(48)</p> <p>Scale: As Noted Date: February 2021</p> |
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WATER POLLUTION AND EROSION CONTROL NOTES

- e. Do not mix substances with one another unless recommended by the manufacturer.
 - f. Whenever possible, use a product up completely before disposing of the container.
 - g. Follow manufacturer's recommendations for proper use and disposal.
 - h. Conduct a daily inspection to ensure proper use and disposal of materials onsite.
2. Hazardous Material Pollution Prevention Plan
- a. Keep products in original containers unless they are not resealable.
 - b. Retain original labels and Safety Data Sheets (SDS), formerly Material Safety Data Sheets (MSDS).
 - c. Dispose of surplus products according to manufacturers' instructions and local and State regulations.
3. Onsite and Offsite Product Specific Plan
The following product specific practices shall be followed onsite:
- a. Petroleum Based Products: Monitor all onsite vehicles for leaks and perform regular preventive maintenance to reduce the chance of leakage. Store petroleum products in tightly sealed containers which are clearly labeled. Apply asphalt substances used onsite according to the manufacturer's recommendation.
 - b. Fertilizers: Apply fertilizers used only in the minimum amounts recommended by the manufacturer and federal, state, and local requirements. Avoid applying just before a heavy rain event. Apply at the appropriate time of year for the location, and preferably timed to coincide as closely as possible to the period of maximum vegetation uptake and growth. Once applied, work fertilizer into the soil to limit exposure to storm water. Do not apply to storm conveyance channels with flowing water. Storage shall be in a covered shed or in an area where fertilizer will not come into contact with precipitation or stormwater. Transfer the contents of any partially used bags of fertilizer to a sealable plastic bin to avoid spills.
 - c. Paints: Seal and store all containers when not required for use. Do not discharge excess paint to the drainage system, sanitary sewer system, or State waters. Dispose properly according to manufacturers' instructions and State and local regulations.
 - d. Concrete Trucks: Washout or discharge concrete truck drum wash water only at a designated site as far as practicable from storm drain inlets or State waters. Do not discharge water in the drainage system or State waters. Disposal by percolation is prohibited. Clean disposal site as required or as requested by the Engineer.
4. Spill Control Plan
- a. Post a spill prevention plan to include measures to prevent and clean up each spill.
 - b. The Contractor shall be the spill prevention and cleanup coordinator. Designate at least three site personnel who shall receive spill prevention and cleanup training. These individuals shall each become responsible for a particular phase of prevention and cleanup. Post the names of responsible spill personnel in the material storage area on a weatherproof bulletin board or other accessible location acceptable to the Engineer and in the office trailer onsite.
 - c. Clearly post manufacturers' recommended methods for spill cleanup. Make site personnel aware of the procedures and the location of the information and cleanup supplies.

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WATER POLLUTION AND EROSION CONTROL NOTES (CONT.)

- d. Keep ample materials and equipment necessary for spill cleanup in the material storage area onsite.
 - e. Clean up all spills immediately after discovery.
 - f. Keep the spill area well ventilated. Personnel shall wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
 - g. Report spills of toxic hazardous material to the appropriate State or local government agency, regardless of the size. Where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302 occurs during a 24-hour period, the Contractor shall notify the Engineer as soon as the Contractor has knowledge of the discharge. The Engineer will notify the National Response Center (NRC) at (800) 424-8802, the Clean Water Branch during regular business hours at 586-4309, and the Hawaii State Hospital Operator at 247-2191 and the Clean Water Branch (DOH-CWB) via email at cleanwaterbranch@doh.hawaii.gov during non-business hours immediately. The Contractor shall also provide to the Engineer, within 7 calendar days of knowledge of the release, a description of the release, the circumstances leading to the release, and the date of the release. The Engineer will provide this information to the DOH-CWB. The Engineer will provide information to the NRC if requested.
- E. PERMIT REQUIREMENTS:
1. A National Pollutant Discharge Elimination System (NPDES) Permit for Construction Activities of one acre or more of disturbed area is required for this project. If the Contractor requires extra land disturbance, including staging and storage areas, that is not covered by the NPDES Permit obtained by the State, the Contractor shall be responsible for obtaining the required NPDES Construction Activities Permit to cover this additional disturbed area. See Hawaii Administrative Rules Chapter 11-55, Appendix C for definition of land disturbance. The Contractor's attention is directed to the applicable NPDES Permit documents on the bid package compact disc.
 2. Comply with all applicable State and Federal Permit conditions. Permits may include, but not limited to the following:
 - a. NPDES Permit for Construction Activities
 - b. NPDES Permit for Construction Dewatering
 - c. NPDES Permit for Hydrotesting Waters
 - d. Water Quality Certification
 - e. Stream Channel Alteration Permit
 - f. Section 404 Army Corps of Engineer Permit
- F. SITE-SPECIFIC BMP REQUIREMENTS:
Each BMP below is referenced to the corresponding section of the current HDOT Construction Best Management Practices Field Manual and appropriate Supplemental Sheets. The Manual may be obtained from the HDOT Statewide Stormwater Management Program Website at <http://www.stormwaterhawaii.com/resources/contractors-and-consultants/> under Construction Best Management Practices Field Manual. Supplemental BMP sheets are located at <http://stormwaterhawaii.com/contractors-and-consultants/storm-water-pollution-prevention-plan-swppp/> under Concrete Curing and Irrigation Water.
- The requirements for Water Pollution, Dust, and Erosion Control submittals are included in Section 209 of the Hawaii Standard Specifications for Road and Bridge Construction dated 2005 and applicable Special Provisions. A list of pollutant sources and corresponding BMP used to mitigate the pollutants are included in Section 209 of the Special Provisions under Appendix A.

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WATER POLLUTION AND EROSION CONTROL NOTES (CONT.)

- F. (Continued)
Follow the requirements below:
1. Protect all Drainage Inlets receiving runoff from disturbed areas (SC-2).
 2. Contain on-site runoff using Perimeter Sediment Controls
 - a. SC-1 Silt Fence
 - b. SC-5 Vegetated Filter Strips and Buffers
 - c. SC-8 Compost Filter Berm
 - d. SC-13 Sandbag Barrier
 - e. SC-14 Brush or Rock Filter
 3. Control offsite runoff from entering construction area
 - a. EC-8 Run-On Diversion
 - b. SC-6 Earth Dike
 - c. SC-7 Temporary Drains and Swales
 4. Incorporate applicable Site Management BMP
 - a. SM-1 Employee Training
 - b. SM-2 Material Delivery and Storage
 - c. SM-3 Material Use
 - d. SM-4 Protection of Stockpiles
 - e. SM-6 Solid Waste Management
 - f. SM-7 Sanitary/Septic Waste Management
 - g. SM-9 Hazardous Waste Management
 - h. SM-10 Spill Prevention and Control
 - i. SM-11 Vehicle and Equipment Cleaning
 - j. SM-12 Vehicle and Equipment Maintenance
 - k. SM-13 Vehicle and Equipment Refueling
 - l. SM-14 Scheduling
 - m. SM-15 Location of Potential Sources of Sediment
 - n. SM-16 Preservation of Existing Vegetation
 - o. SM-18 Dust Control
 5. Contain pollutants within the Construction Staging/Storage Area BMP with applicable Perimeter Sediment Controls and Site Management BMP. Include a Stabilized Construction Entrance/Exit (EC-2) for all areas which exit onto a paved street. Restrict vehicle access to these points.
 6. Manage Concrete Waste including installing a Concrete Washout Area (SM-5) and properly disposing of Concrete Curing Water (California Stormwater BMP Handbook NS-12 Concrete Curing).
 7. Remove saw cut slurry and hydrodemolition water from the site by vacuuming. Provide storm drain protection and/or perimeter sediment controls during saw cutting and hydrodemolition work.

NPDES NOTES

1. Contractor shall obtain NPDES permit for off-site staging area to assemble post-tensioned sections.

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| | <p>STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION</p> <p>WATER POLLUTION & EROSION CONTROL NOTES - 2</p> <p><i>Kamehameha Highway Kaipapau Stream Bridge Replacement Federal Aid Project No. BR-083-1(48)</i></p> |
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BOARD OF WATER SUPPLY NOTES

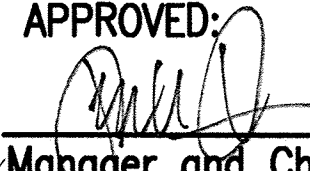
1. Unless otherwise specified, all materials and construction of water system facilities and appurtenances shall be in accordance with the STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, dated 2005, as amended, of the Hawaii Highways Division, Department of Transportation, and the City and County of Honolulu Board of Water Supply's "WATER SYSTEM STANDARDS", DATED 2002, THE "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 1991, and all subsequent amendments and additions.
2. All plans approved by the Board of Water Supply are based solely on the adequacy of the water supply. All other features of the water system, such as lines, grades, fittings, drainage, etc., and other features of improvements shall not be the responsibility of the Board of Water Supply.
3. Test pressure shall be 150 psi. During the 30-minute pressure test, the pressure shall not drop more than 10 psi.
4. The Contractor shall notify BWS Capital Projects Division, Construction Section in writing and submit six (6) sets of approved construction plans one week prior to commencing work on the water system.
5. After installation of tapping sleeve and valve prior to actual tapping operations, the assembly shall be tested at 150 psi. on both sides of the valve.
6. The Contractor shall chlorinate the entire inside surface of each pipe and fitting with disinfection solution of 5 ounces of sodium hypochlorite mixed with 10 gallons of water. (for connection only)
7. The Contractor shall be responsible for the protection of all water lines during construction. The Contractor shall be especially careful when excavating behind water lines, tees, and bends wherever there is a possibility of water line movement due to the removal of the supporting earth beyond the existing reaction blocks. The Contractor shall take whatever measures necessary to protect the water lines, such as constructing special reaction blocks (with BWS approval) and/or modifying his construction method.
8. The existence and location of underground utilities and structures as shown on the plans are from the latest available data but is not guaranteed as to the accuracy or the encountering of other obstacles during the course of work. The Contractor shall be responsible and shall pay for all damages to existing utilities. The Contractor shall not assume that where no utilities are shown, that none exist.
9. Prior to installation, the Contractor shall submit for approval by Board of Water Supply, the manufacturer's certification that all cast iron (gray or ductile) fittings for the project conform in all respects to the Water System Standards, dated 2002.
10. Polygon shape for mechanical joint glands as described in AWWA Standard C111 shall be "straight-sided" or an approved equal on a job-to-job basis.
11. Re-approval shall be required if this project is not under construction within a period of two (2) years.
12. The Contractor/developer shall obtain a NPDES permit prior to chlorination and/or dewatering. A copy of the permit shall be submitted to the Board of Water Supply, Capital Projects Division, Construction Section.
13. Pipe cushion shall be of high resistivity material. The Contractor shall submit a soil certification that high resistant cushion material has a resistivity greater than 5,000 ohm-cm. Remainder of the backfill material shall be as specified in the water system standards. Pipe cushion and backfill material shall contain no hazardous substances above regulatory action levels including but not limited to lead, asbestos, mercury, chromium, cadmium, zinc, strontium, and polychlorinated biphenyls (pcb).
14. All ductile iron pipe, fittings and valves shall be wrapped with two (2) layers of 8 mil. polyethylene wrap. The inside surface of the polyethylene wrap to be in contact with the pipe exterior shall be infused with a blend of an antimicrobial to mitigate microbiologically influenced corrosion and a volatile corrosion inhibitor to control galvanic corrosion.
15. All ductile iron pipe and fittings, including sections requiring reinforced concrete jacketing, shall be ductile iron Class 53, and zinc coated as per the BWS Water System Standards.
16. Easement documents must be submitted to BWS and recorded before completion of project is issued.

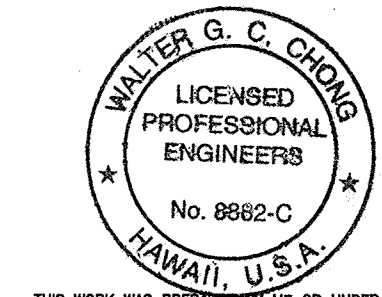
BOARD OF WATER SUPPLY NOTES (CONT.)

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 7 | 161 |

17. Cleaning shall be by the use of "pigs" introduced into the pipeline and run completely through all installed pipelines and all branch lines for fire hydrants. "Pigging" of service laterals is not required. Bare foam "pigs" shall be used to swab piping clean as each length of the pipeline is installed. Each "pig" shall consist of a cylindrical piece of polyurethane foam with a density of 3-7 pounds per cubic foot and a vinyl-coated nose. Outside diameter of the "pig" shall be equal to 1-1/4 to 1-1/2 times the inside diameter of the pipe being installed. The length of the "pig" shall be 1-1/2 to 2 times its diameter. Prior to use, the "pig" shall be submerged in a chlorine solution of 1 oz. of 5% chlorine bleach in 5 gallons of water. "Pigging" of the pipeline shall be considered incidental to the installation of the new pipeline.
18. All fire hydrants to be adjusted and/or relocated shall be replaced with new fire hydrants, unless otherwise directed by the BWS.
19. Two-way blue reflective hydrant markers Type DB shall be installed at all new fire hydrant installations. Contractor shall verify the exact locations of hydrant markers with the nearest Honolulu Fire Department Battalion Chief.
20. Ball corp and ball stop shall be used in lieu of a corporation stop and stopcock, respectively.
21. Install 4 mil thick, non-metallic, blue colored, 6 inches wide warning tape over centerline of the pipe and below the base course along the entire length of trench. Tape should be marked with "caution water line buried below".
22. The Contractor shall install electronic markers to all mains and test the electronic markers prior to installations to verify proper operation. BWS personnel shall verify the number and locations of placed electronic markers before final paving of the project.
23. For ductlines crossing existing or new waterline:
 - A. At the electrical/signal ductline water crossings, adjust all electrical/signal ductline elevations to maintain 12" vertical clear separation from all waterlines at no cost to the board of water supply.
 - B. Maintain 3'-0" min. horizontal clear separation between all waterline systems and nearest electrical/signal ductlines paralleling the water system at no cost to the board of water supply.
 - C. Maintain 3'-0" min. horizontal clear separation between street light/traffic signal, standards (including any modular units) and the nearest water system.
 - D. Contractor shall field verify for any conflicts at each street light/traffic signal standard location. Where conflicts occur, the contractor shall coordinate with the project engineer to revise the street light/traffic signal standard to provide the required clearances at no cost to the BWS.
24. For cut-in connection to existing: All waterline construction requiring shutdown connection shall be scheduled for after working hours at six (6) hours maximum downtime.
25. Contractor shall cut and plug all existing unused laterals at the mains whether or not shown on the plans. Meter and valve boxes to be or already abandoned shall be demolished or removed and properly disposed of. The damaged area shall be repaired to an equal or better condition than the immediate area. All work shall be done at the expense of the contractor.
26. Board of Water Supply approval of these plans does not constitute a water commitment. Availability of water will be determined when building permit is presented to the department. Water commitment will depend upon the status of the water system at that time. Should water service be made available, the water commitment will be effective when the project receives an approved building permit from the building department. All water commitments will be canceled in the event the building permit is canceled.

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| DESIGNED BY | DATE |
| DRAWN BY | |
| CHECKED BY | |
| IN CHARGE | |
| NOTED BY | |
| DATE | |

APPROVED:  DATE: MAY 24 2021
 For Manager and Chief Engineer, BWS (for work affecting BWS facilities State R/W & BWS easements only)



WATER G. C. CHONG
 LICENSED PROFESSIONAL ENGINEERS
 No. 8862-C
 HAWAII, U.S.A.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

WATER NOTES - 1

**Kamehameha Highway
 Kaipapau Stream Bridge Replacement
 Federal Aid Project No. BR-083-1(48)**

Scale: As Noted Date: February 2021

SHEET No. C-6 OF SHEETS

WATER METER INSTALLATION NOTES (FOR METERS SMALLER THAN 3 INCHES)

1. Prior to any excavating, the Contractor shall verify in the field, the location of existing waterlines and appurtenances.
2. Any adjustments to the existing water system required during construction, to meet the requirements of the BWS Standards, whether shown on the plans or not, shall be done by the Contractor at no cost to the Board.
3. The project shall be subject to the Board of Water Supply's Cross-Connection Control requirements prior to issuance of the Building Permit.
4. The installation, chlorination and testing of the water main and facilities after the meter shall not be the responsibility of the Board of Water Supply.
5. The backflow preventer device must be installed before meter is issued.
6. The Contractor shall furnish and install polyethylene wrap, 3 feet minimum at all taps (for DI pipe and copper lateral combination only).
7. Ball corp. and ball stop shall be used in lieu of a corporation stop and stopcock, respectively.

WATERLINE CHLORINATION & TESTING PROCEDURES

The following chlorination and water sample collection procedure shall apply to all water pipeline projects (All work to be coordinated through BWS Inspector):

1. Chlorination of Water Systems
 - a. The Contractor shall provide a 4 week advance notice, in writing, to the Officer-In-Charge for proposed flushing, filling and bacterial testing of the new pipeline.
 - b. The Contractor shall hire a State of Hawaii – Department of Health certified laboratory to provide water sampling services and to deliver water samples to the Micro Lab for analysis. Water samples for bacterial testing shall be delivered no later than 2:30 p.m. on the day the samples are taken to the BWS Micro Lab located at 630 S. Beretania St., Honolulu, HI 96843. The Micro Lab shall perform analysis and provide their results to the Officer-In-Charge by 4:30 p.m. on the following day (in some cases, final results notification may take up to 48 hours).
 - c. Water mains shall be disinfected in accordance with Honolulu Board of Water Supply Water System Standards (2002), as amended.
 - d. Liquid chlorine, chlorine based liquid disinfectants or calcium hypochlorite that has been tested and certified as meeting the specifications of ANSI/NSF Standard 60, Drinking Water Treatment Chemicals – Health Effects, shall be used for the chlorination of the water mains.
 - e. Prior to chlorination, the water mains shall be thoroughly flushed.
 - f. The interior surfaces of the water mains shall be exposed to the chlorinating solution by completely filling the main remove air pockets, for a minimum of 24- hours and the free chlorine residual shall not be less than 10 ppm after such time.
 - g. Should the calcium hypochlorite be used, no solid and/or undissolved portion of the compound shall be introduced into any section of the water mains to be chlorinated.
 - h. At the end of the 24-hour disinfection period, representative samples shall be taken and analyzed to assure a free chlorine residual of a least 10 ppm.
 - i. Should the free chlorine residual results indicate adequate chlorination, the water mains shall be thoroughly flushed and filled with water from the existing system and again tested for free chlorine residual. The flushing shall be considered adequate if the free chlorine residual test results indicate that the water in the water mains has a comparable chlorine residual as the water in the existing system.
 - j. The Contractor shall be responsible for the proper disposal of chlorinated water to safeguard public health and the environment in accordance with applicable State of Hawaii Department of Health requirements. A neutralizing chemical shall be applied to the water to be disposed to thoroughly neutralize the chlorine residual remaining in the water in accordance with Honolulu Board of Water Supply Water System Standards (2002), as amended.

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| Fig. | |

WATERLINE CHLORINATION & TESTING PROCEDURES (CONT.)

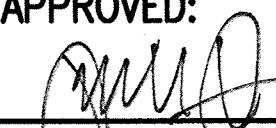
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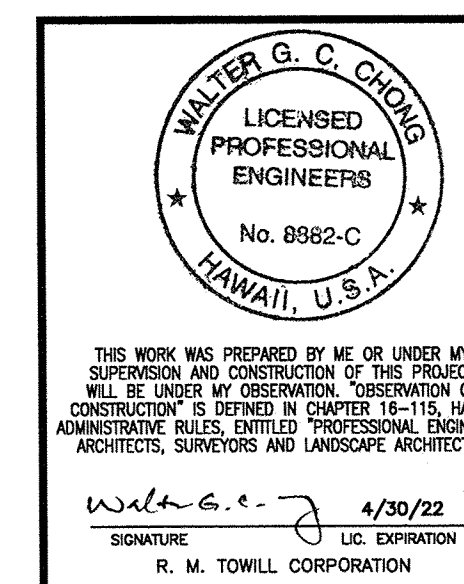
- k. The Contractor shall be responsible for obtaining a National Pollutant Discharge Elimination System (NPDES) Permit from the Department of Health, Clean Water Branch prior to the start of construction, for the disposal of water used for hydro testing and chlorination, as required by the contract documents.
- l. Following the acceptable flushing of the water mains, three (3) consecutive days of acceptable samples, taken at least 24-hours apart, from representative points shall be taken and subjected to microbiological tests. For water lines, at least one set of samples shall be collected from every 1,200 feet of the new water main, plus one from the end of the line and at least one set from each branch. Positive or invalid test results will not be acceptable and the process will be repeated.
- m. All measurements for chlorine residual shall be analyzed using E.P.A. approved methods for drinking water.
- n. All microbiological tests shall be performed by a laboratory approved by the Department of Health, State of Hawaii and the Water Quality Division of the Honolulu Board of Water Supply.
- o. The Contractor shall be responsible for all costs associated with all of the foregoing.
- p. Cleaning and Swabbing procedures shall be in accordance with Honolulu Board of Water Supply Water System Standards (2002), as amended.

All materials in direct contact with the potable water shall have National Sanitation Foundations (NSF) approvals. The Contractor shall submit these approvals to the Board of Water Supply for information only prior to its application.

PVC NOTES (PVC INSTALLATIONS/RELOCATIONS OF WATERLINES)

1. Polyvinyl chloride (PVC) pipes shall be DR 14 (for 4"–12"). All ductile iron valves and metallic fittings shall be wrapped with two layers of 8 mil polyethylene wrap. No bending of polyvinyl chloride pipes shall be permitted. The installation of PVC pipe, according to the plans and specifications as bid on by the Contractor, may require additional design work, and additional fittings, and shall be considered incidental to the unit price bid in the proposal for PVC pipe. Any additional design work shall be the responsibility of the Contractor.
2. The Contractor shall furnish and install polyethylene wrap, 3 feet minimum at all taps (for DI pipe and copper lateral combination only).
3. PVC fittings, including deflection couplings are not approved.
4. All sections of the water main requiring reinforced concrete jacketing shall be ductile iron pipe Class 53 with ductile iron fittings
5. Bossed tees required for all lateral and ARV connections to PVC mains 12" and smaller.
6. Ductile iron fittings shall be used for all types of fittings

APPROVED:  MAY 24 2021
 Manager and Chief Engineer, BWS (for work affecting BWS facilities State R/W & BWS easements only) DATE



STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

WATER NOTES - 2

Kamehameha Highway
Kaipapau Stream Bridge Replacement
 Federal Aid Project No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. C-6A OF SHEETS

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
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| HAWAII | HAW. | BR-083-1(48) | 2021 | 9 | 161 |

GENERAL NOTES FOR TRAFFIC CONTROL PLAN

- The Contractor shall make minor adjustments at intersection, driveways, bridges, structures, etc, to fit field conditions.
- Cones or delineators shall be extended to a point where they are visible to approaching traffic.
- Traffic control devices shall be installed such that the sign or device farthest from the work area shall be placed first. The others shall then be placed progressively toward the work area.
- Regulatory and warning signs within the construction zone that are in conflict with the traffic control plans shall be removed or covered. All signs shall be restored upon completion of the work.
- When required by the issuing office, the permittee shall install a flashing arrow signal as shown on the traffic control plans.
- All traffic lanes shall be a minimum of ten (10) feet wide.
- All construction warning signs shall be promptly removed or covered whenever the message is not applicable or not in use.
- The backs of all signs used for traffic control shall be appropriately covered to preclude the display of inapplicable sign messages (i.e., when signs have messages on both faces).
- At the end of each day's work or as soon as the work is completed, the permittee shall remove all traffic control devices no longer needed to permit free and safe passage of public traffic. Removal shall be in the reverse order of installation.
- Sign spacing (D), taper lengths (T) and spacing of cones or delineators shall be as shown in Table 645-1, unless otherwise noted on the Traffic Control Plans.

| Posted Speed Limit (M.P.H.) | Sign Spacing (D) (Feet) | Taper Length (T) (Feet) | | Longitudinal Buffer Space (B) (Feet) | Spacing of Cones or Delineators (Feet) | | |
|-----------------------------|-------------------------|-------------------------|---------|--------------------------------------|--|---------|-----------|
| | | W = 12' Or Less | W > 12' | | Taper | Tangent | Work Area |
| 25 | 250 | 200 | W X 17 | 55 | 25 | 25 | 10 |

W = Width of Lane, Shoulder, or Offset

- Contractor to provide access and/or directional signs to reroute pedestrian traffic.
- All workers who are exposed to either vehicles using the roadway or to construction equipment shall wear high visibility safety apparel that meets the performance class 3 requirements of "ANSI/ISEA 107-2004". "Workers" is defined as people on foot whose duties place them within the State Right-of-Way, such as but not limited to construction and maintenance forces, equipment operators, survey crew, utility crews, responders to incidents (E.G., EMT and firemen), and law enforcement personnel directing traffic, investigating accidents, handling lane closures and constructed roadways.
- Flaggers and/or police officers shall be insight of each other or in direct communications at all times.
- Lane Closures shall be only during the hours indicated in section 645. During those hours, the movable barriers shall be deployed to the location indicated in the contract documents. During the hours when the lane closures are not allowed, the movable barriers shall be moved to the storage position. All movable barriers shall have a preformed 6-inch wide pavement stripe applied to the face facing traffic. Maintain stripe for the duration of the project.
- Permanent pavement markings and traffic signs shall be replaced upon completion of each phase of work.
- Driveways shall be kept open unless the Owners of the property using the Right-of-Way are otherwise provided for satisfactorily. Further, the Contractor shall control traffic going in and out of driveways.
- Buffer and taper areas on approach to any work area shall be kept clear of vehicles and equipment.
- A high level warning device (flag tree) shall be installed on approach to all work areas.

- An advertisement shall be placed in the newspaper by the Contractor for any lane closures. The advertisement shall be made one (1) week before any lane closure and shall contain the following information:

- Map of the Traffic Change Limits;
- Notice of starting and ending dates, times & duration;
- Map to show Lane Closure;
- Explanation of the Lane Closure, "Notice to Motorists"

The Contractor shall be required to have any lane closures announced daily over the radio two (2) days before starting date until the work is completed. Both advertisements in the newspaper and the radio shall be aid for by the Contractor. The Contractor shall also notify the Hospital, ambulatory services, Police Department and Fire Department of the lane closure.

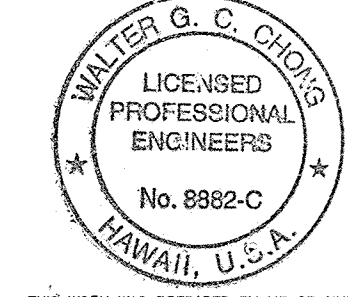
- The buffer space should extend so the two-way traffic taper is placed before a horizontal (or crest vertical) curve to provide adequate sight distance for the flagger and a queue of stopped vehicles.

- No lane closures will be allowed during holidays without the prior approval of the engineer.

WORK ZONE NOTES

- This Work Zone Sign Plan is intended for use on long-term stationary work zones/construction phases (3 days or more). All work zones or construction phases less than 3 days duration will use Traffic Control Plans shown in Section 645 of the Special Provisions. See sheet C-49 to C-52 for Work Zone Signing and temporary traffic control measures.
- All existing regulatory speed limit signs with posts within the work zone/project limits shall be removed and replaced with work zone speed limit sign assemblies (R2-1(XX) and R2-5b(XX) with "CONSTRUCTION AREA" AND "\$250 FINE HRS 291C-104" Supplemental Signs).
- Construction sign assemblies shall be installed on both the approaching and trailing ends of each work zone as shown on this plan.
- Each construction warning sign shall have a minimum of two (2) Type II OM. Each work zone speed limit assembly shall have a minimum of one (1) Type II OM. Installation of each Type II OM shall be considered incidental to Item No. 645.1000, Traffic Control.
- Upon the completion of all physical work or as directed by the Engineer, all construction signs and work zone speed limit assemblies shall be removed. All speed limit signs and posts that were existing at the start of the project within the work zone/project limits shall be restored back to their original locations and configurations.
- Placement of construction signs shall not obstruct the path of pedestrians and bicyclists.
- The removal and restoration of existing regulatory speed limit signs with new posts along with the installation, maintenance and removal of work zone speed limit sign assemblies shall be considered incidental to Item No. 645.1000, Traffic Control.

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| ORIGINAL PLAN | |
| NOTE BOOK | |
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|  <p>WALTER G. C. CHONG LICENSED PROFESSIONAL ENGINEERS No. 8882-C HAWAII, U.S.A.</p> | <p>STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION</p> <p>TRAFFIC CONTROL & WORK ZONE NOTES</p> <p><i>Kamehameha Highway Kaipapau Stream Bridge Replacement Federal Aid Project No. BR-083-1(48)</i></p> |
| <p>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. OBSERVATION OF CONSTRUCTION IS DEFINED IN CHAPTER 10-115, HAWAII ADMINISTRATIVE RULES, ENTITLED "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS."</p> <p>Walter G. C. Chong SIGNATURE R. M. TOWILL CORPORATION</p> | <p>Scale: As Noted Date: February 2021</p> |

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
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| HAWAII | HAW. | BR-083-1(48) | 2021 | 11 | 161 |

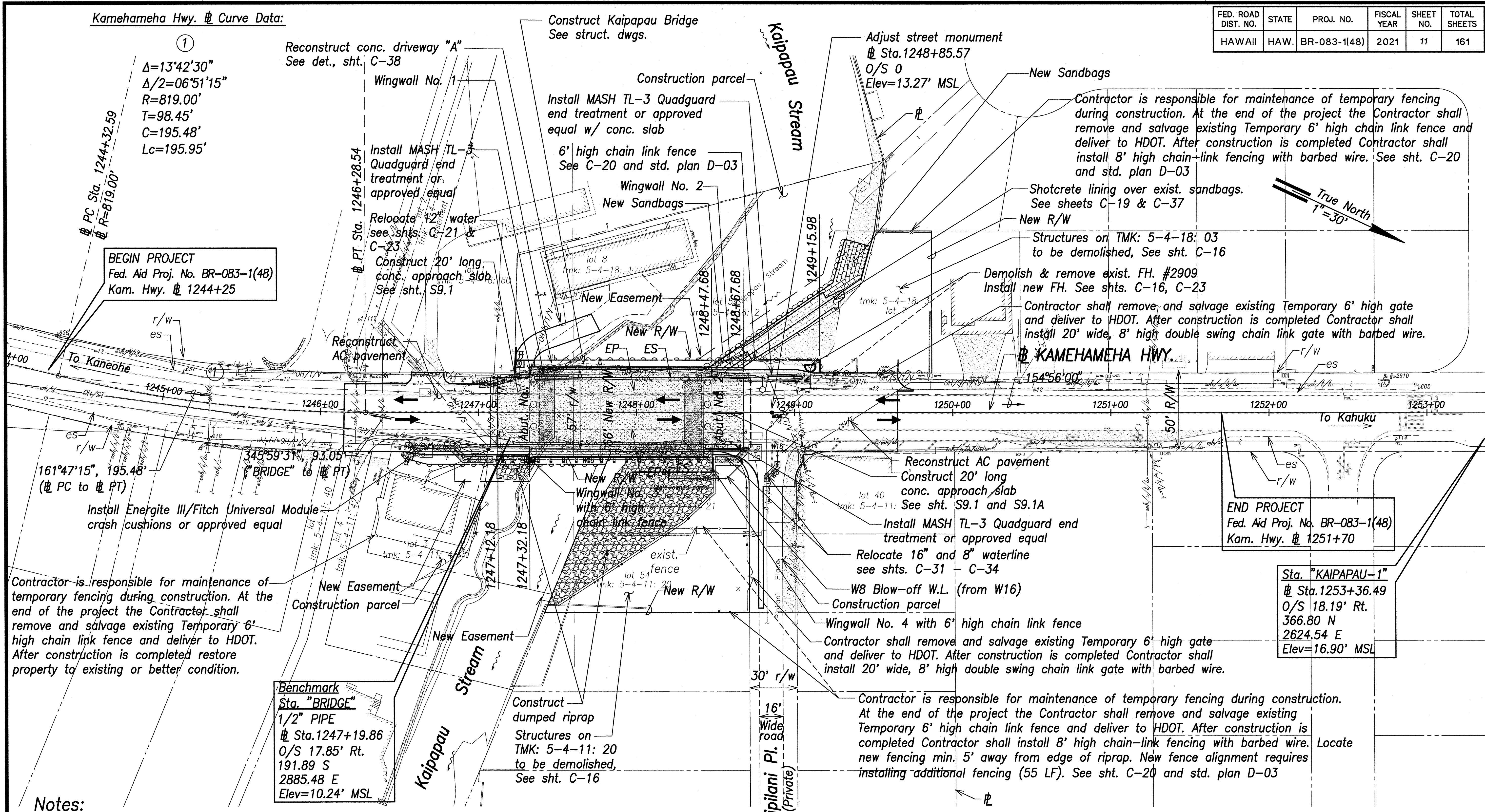
Kamehameha Hwy. @ Curve Data:

①

$\Delta=13^{\circ}42'30''$
 $\Delta/2=06^{\circ}51'15''$
 $R=819.00'$
 $T=98.45'$
 $C=195.48'$
 $Lc=195.95'$

PC Sta. 1244+32.59
 R=819.00'

BEGIN PROJECT
 Fed. Aid Proj. No. BR-083-1(48)
 Kam. Hwy. @ 1244+25



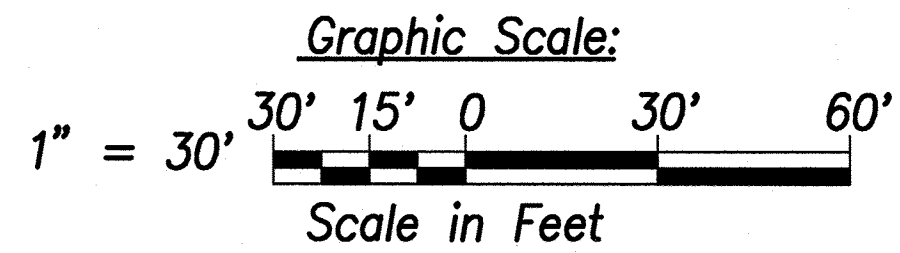
Contractor is responsible for maintenance of temporary fencing during construction. At the end of the project the Contractor shall remove and salvage existing Temporary 6' high chain link fence and deliver to HDOT. After construction is completed restore property to existing or better condition.

Benchmark
 Sta. "BRIDGE"
 1/2" PIPE
 @ Sta. 1247+19.86
 O/S 17.85' Rt.
 191.89 S
 2885.48 E
 Elev=10.24' MSL

Notes:

- See sheet C-11 for overall construction phasing, sheet C-21 for 12" waterline phasing, and sheet C-31 for 16" waterline phasing.
- The Contractor shall comply with Environmental Permit Conditions.
- Kaipapau Stream is able to convey a 2-year storm, 1-hour storm. The stream frequently overtops. It is critical that the Contractor shall ensure that the flow capacity of the Kaipapau Stream is not reduced during a storm event. Equipment and materials within the stream during a storm event shall be removed immediately. Final damages that occur due to the contractor equipment and materials blocking flow during a rain storm will be the contractor's responsibility.
- The Contractor shall construct a temporary detour road, 16" temporary detour waterline, and other temporary improvements. See sht. C-11.

GENERAL SITE PLAN
 SCALE 1"=30'



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| DRAWN BY | |
| CHECKED BY | |
| IN CHARGE | |
| NOTED BY | |
| QUANTITIES BY | |
| NO. | |

MAI TER G. C. CHONG
 LICENSED PROFESSIONAL ENGINEERS
 No. 8382-C
 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. OBSERVATION OF CONSTRUCTION IS DEFINED IN CHAPTER 18-115, HAWAII ADMINISTRATIVE RULES, ENTITLED "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS."

4/30/22
 LIC. EXPIRATION
 R. M. TOWILL CORPORATION

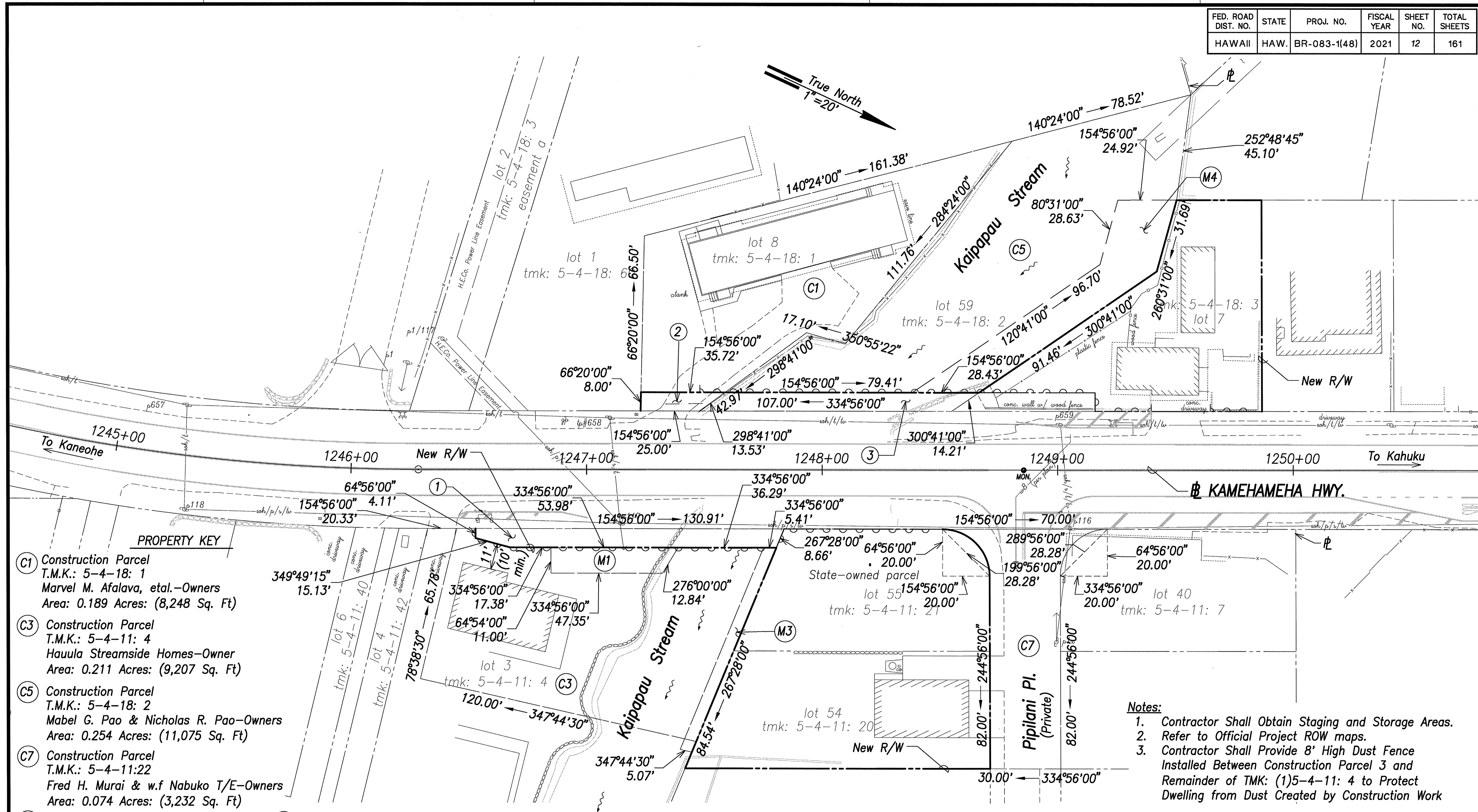
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

GENERAL SITE PLAN

Kamehameha Highway
 Kaipapau Stream Bridge Replacement
 Federal Aid Project No. BR-083-1(48)

Scale: As Noted Date: February 2021

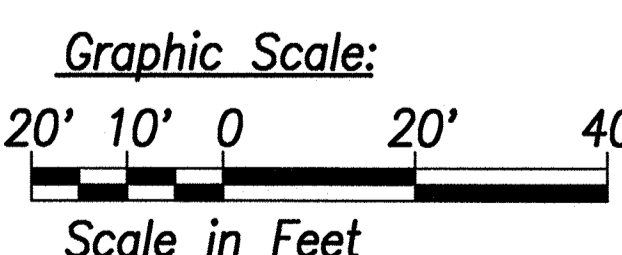
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| HAWAII | HAW. | BR-083-1(48) | 2021 | 12 | 161 |



- PROPERTY KEY**
- (C1) Construction Parcel
T.M.K.: 5-4-18: 1
Marvel M. Afalava, etal.-Owners
Area: 0.189 Acres: (8,248 Sq. Ft)
 - (C3) Construction Parcel
T.M.K.: 5-4-11: 4
Hauula Streamside Homes-Owner
Area: 0.211 Acres: (9,207 Sq. Ft)
 - (C5) Construction Parcel
T.M.K.: 5-4-18: 2
Mabel G. Pao & Nicholas R. Pao-Owners
Area: 0.254 Acres: (11,075 Sq. Ft)
 - (C7) Construction Parcel
T.M.K.: 5-4-11:22
Fred H. Murai & w.f Nabuko T/E-Owners
Area: 0.074 Acres: (3,232 Sq. Ft)
 - (M1) Maintenance Easement
T.M.K.: 5-4-11: 4
Hauula Streamside Homes-Owner
Area: 0.013 Acres: (557 Sq. Ft)
 - (M3) Maintenance Easement
T.M.K.: 5-4-11: 4
Hauula Streamside Homes-Owner
Area: 0.011 Acres: (468 Sq. Ft)
 - (M4) Maintenance Easement
T.M.K.: 5-4-18: 2
Mabel G. Pao & Nicholas R. Pao-Owners
Area: 0.051 Acres: (2,229 Sq. Ft)
 - ① Right of Way Acquisition
T.M.K.: 5-4-11: 4
Hauula Streamside Homes-Owner
Area: 0.023 Acres: (1,005 Sq. Ft)
 - ② Right of Way Acquisition
T.M.K.: 5-4-18: 1
Marvel M. Afalava, etal.-Owners
Area: 0.006 Acres: (243 Sq. Ft)
 - ③ Right of Way Acquisition
T.M.K.: 5-4-18: 2
Mabel G. Pao & Nicholas R. Pao-Owners
Area: 0.020 Acres: (859 Sq. Ft)

- Notes:**
1. Contractor Shall Obtain Staging and Storage Areas.
 2. Refer to Official Project ROW maps.
 3. Contractor Shall Provide 8' High Dust Fence Installed Between Construction Parcel 3 and Remainder of TMK: (1)5-4-11: 4 to Protect Dwelling from Dust Created by Construction Work

CONSTRUCTION PARCELS & EASEMENTS PLAN
SCALE 1"=20'



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| SURVEY PLANNED BY | DATE |
| DRAWN BY | |
| DESIGNED BY | |
| CHECKED BY | |
| ORIGINAL PLAN | |
| NOTE BOOK | |

WALTER G. C. CHONG
LICENSED PROFESSIONAL ENGINEER
No. 8882-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. OBSERVATION OF CONSTRUCTION IS DEFINED IN CHAPTER 10-115, HAWAII ADMINISTRATIVE RULES, ENTITLED PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS.

Walter G. C. Chong 4/30/22
SIGNATURE LIC. EXPIRATION
R. M. TOWILL CORPORATION

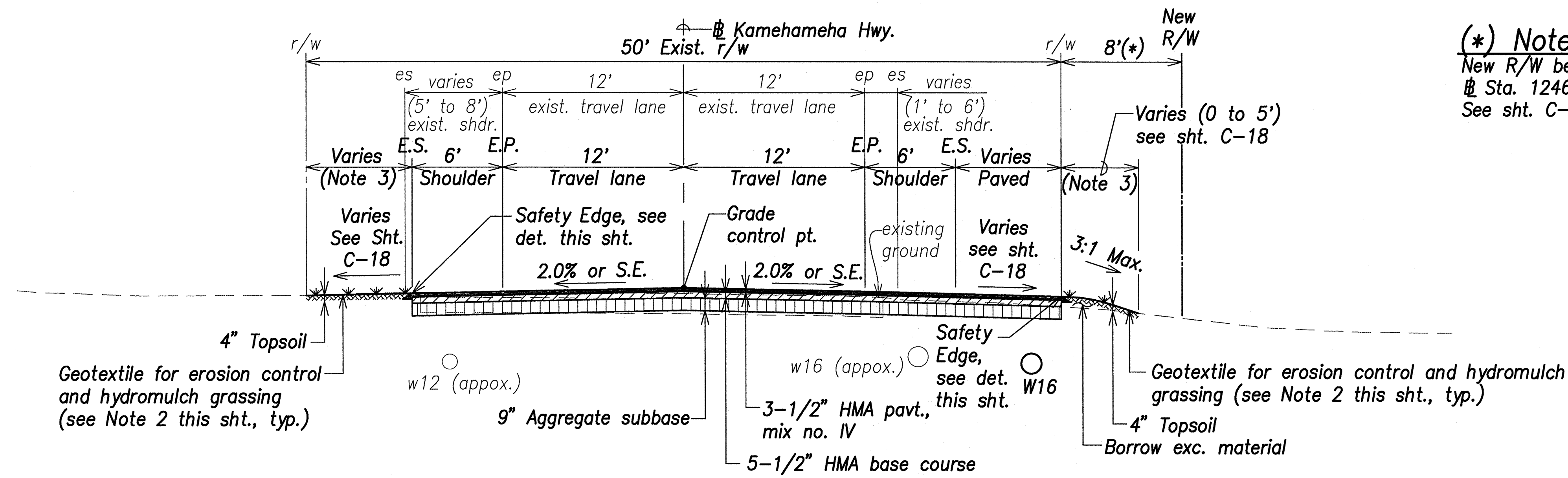
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONSTRUCTION PARCELS & EASEMENTS PLAN
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

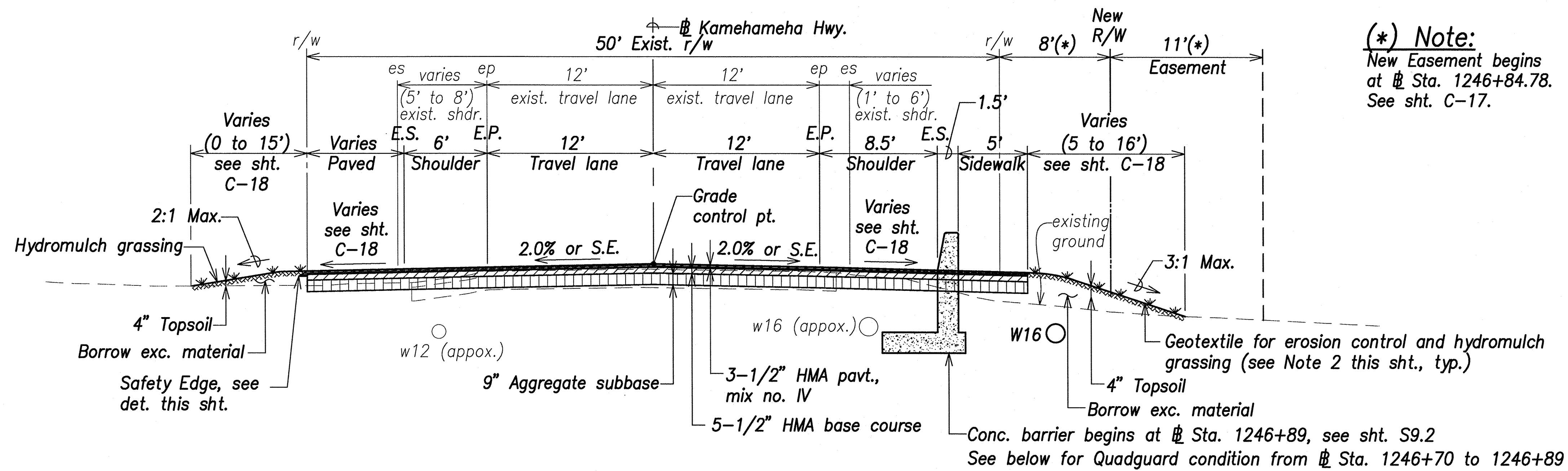
Scale: As Noted Date: February 2021

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 14 | 161 |

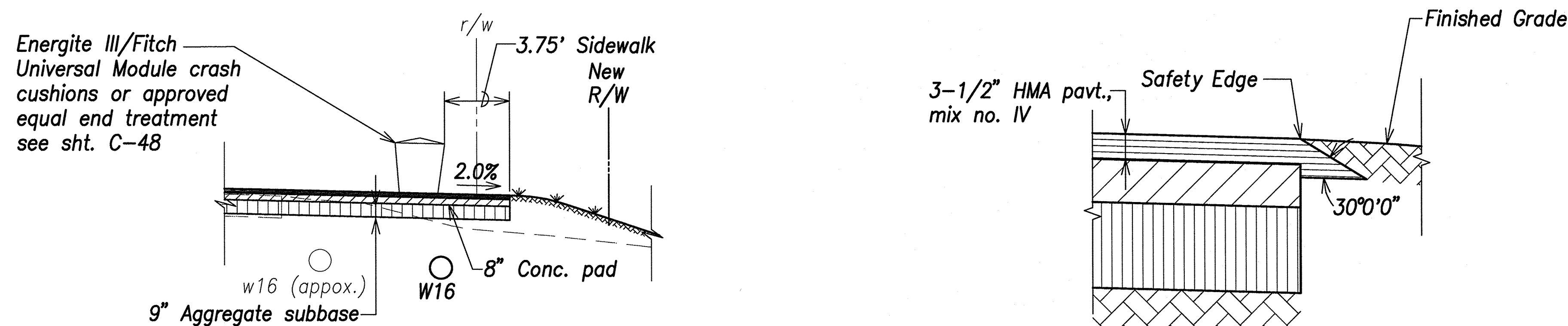
(* Note:
New R/W begins at Sta. 1246+52.78.
See sht. C-17.



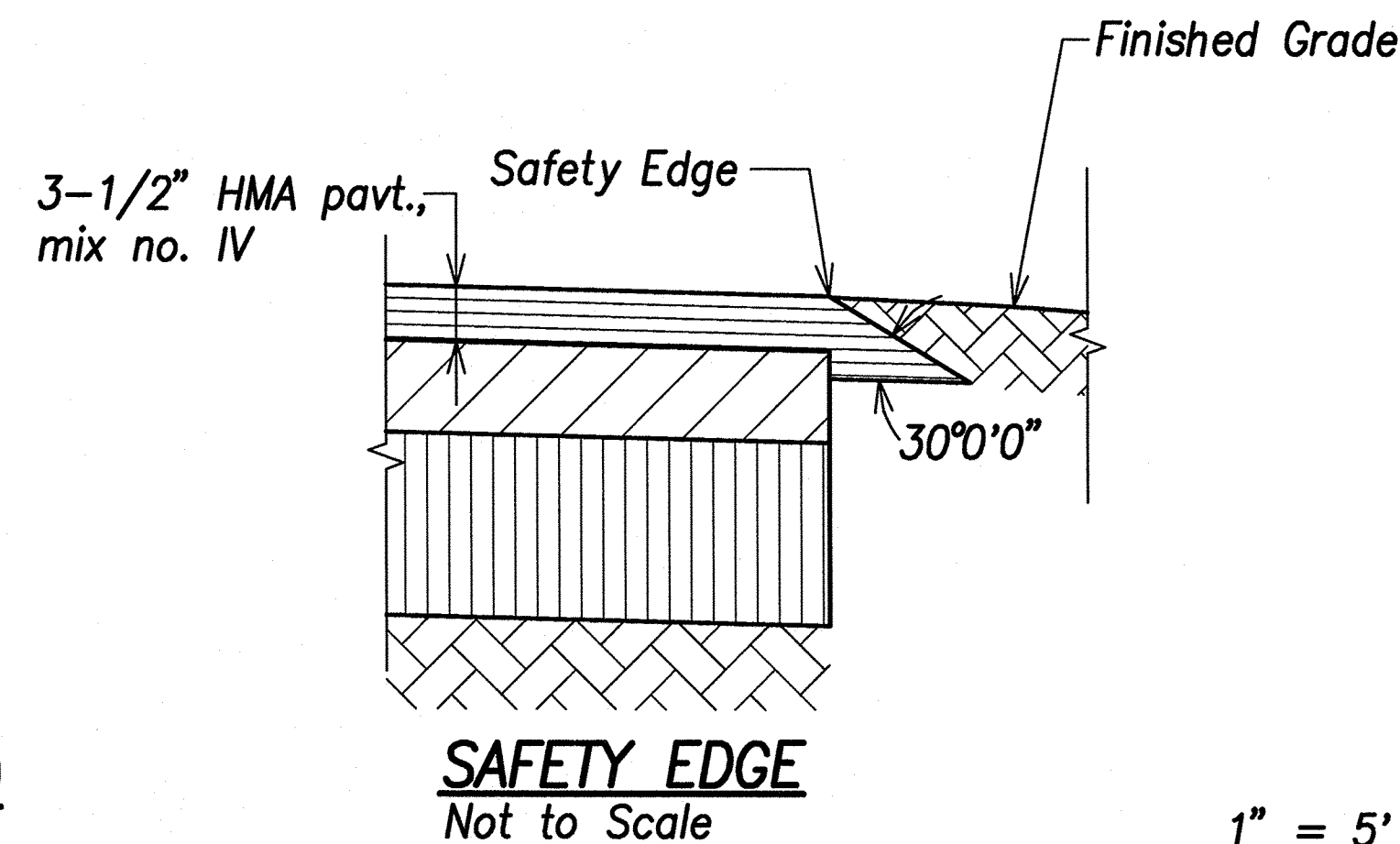
TYPICAL SECTION - (Sta. 1246+15 to Sta. 1246+70)
Scale: 1"=5'



TYPICAL SECTION - (Sta. 1246+70 to Sta. 1247+12.18)
Scale: 1"=5'

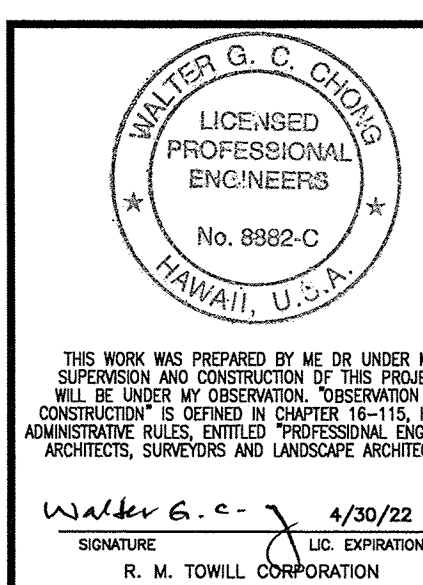
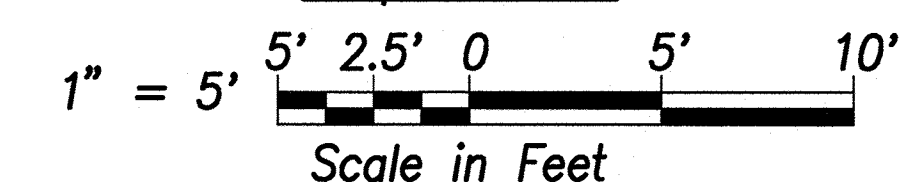


TYPICAL CRASH CUSHION SECTION - (Sta. 1246+70 to Sta. 1246+89)
Scale: 1"=5'



SAFETY EDGE
Not to Scale

Graphic Scale:



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL SECTIONS - 1

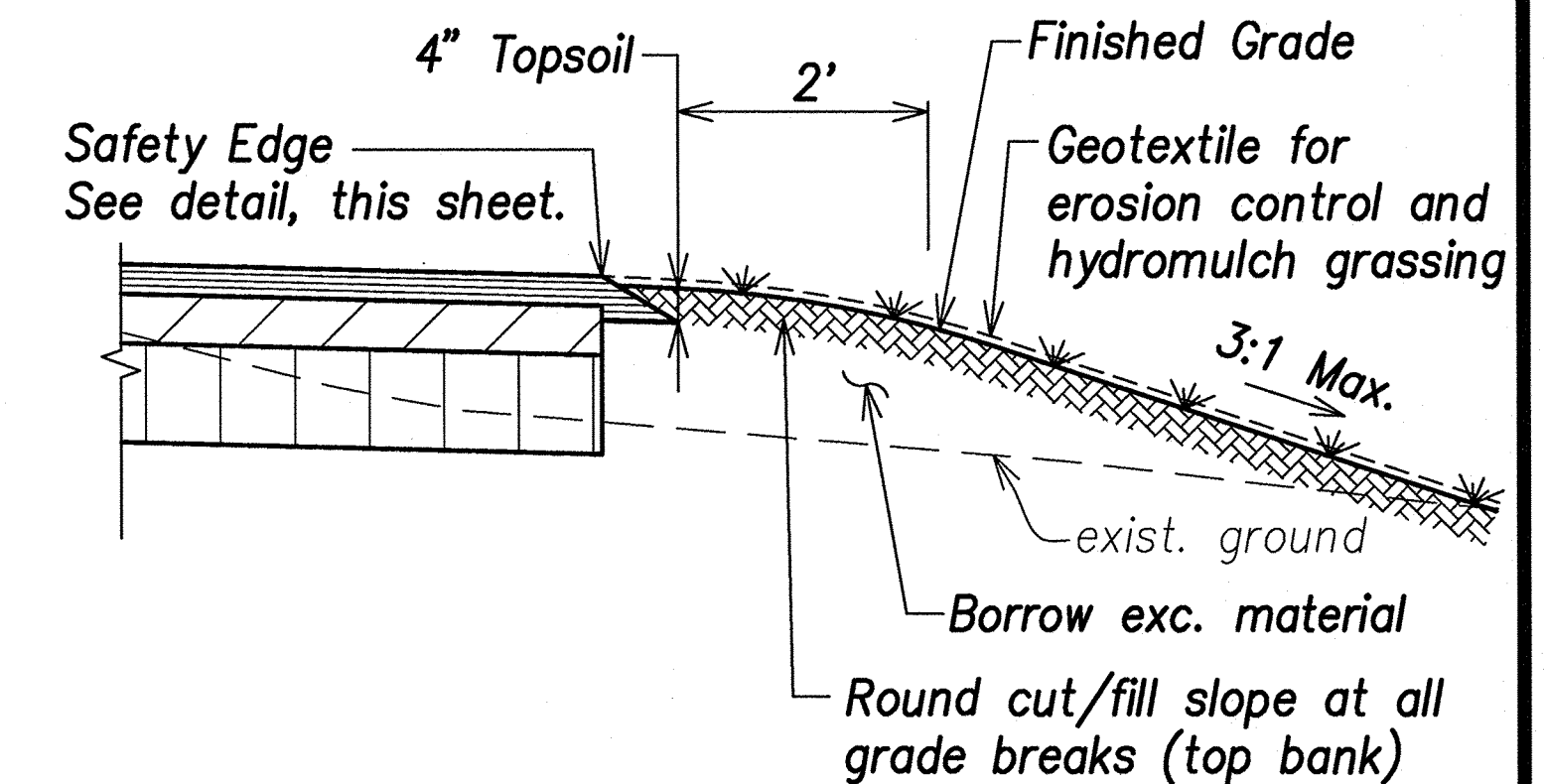
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. C-12 OF SHEETS

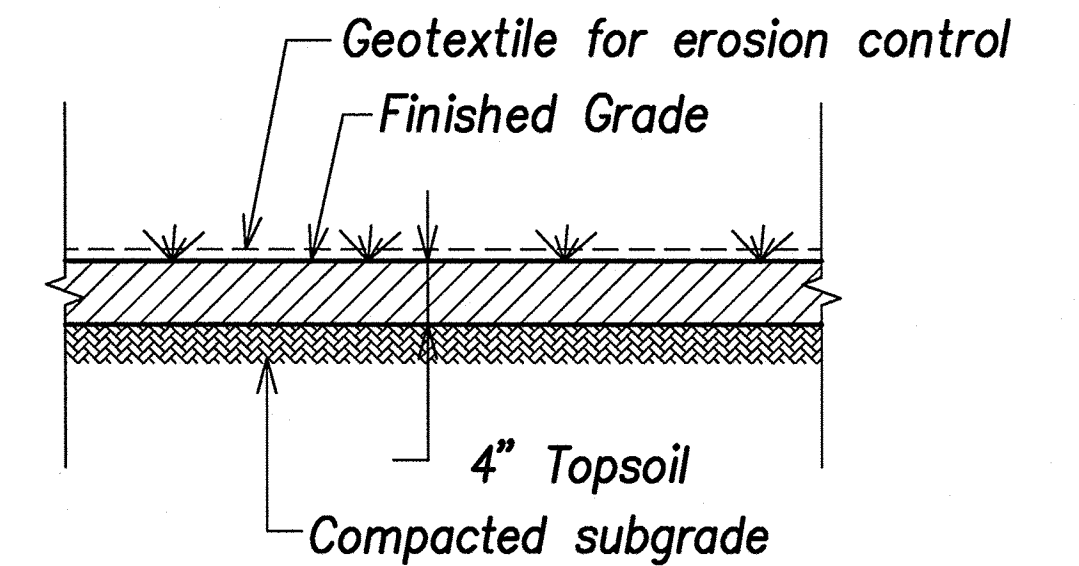
Notes:

1. The Contractor shall photo document the existing landscaping in all adjacent residential lots affected by the project and submit to the engineer. Upon completion of major work items, the Contractor shall restore landscaping back to existing condition or better.
2. Hydromulch Grassing. The Contractor shall broadcast sprigs of seashore paspalum at 10 bushels per 1,000 SF capped with hydromulch at 30 lbs per 1,000 SF.
3. At driveway connections, pavement section shall be 3-1/2" HMA pavt., mix no. IV over 6" Aggregate subbase. See sht. C-17 and C-20.



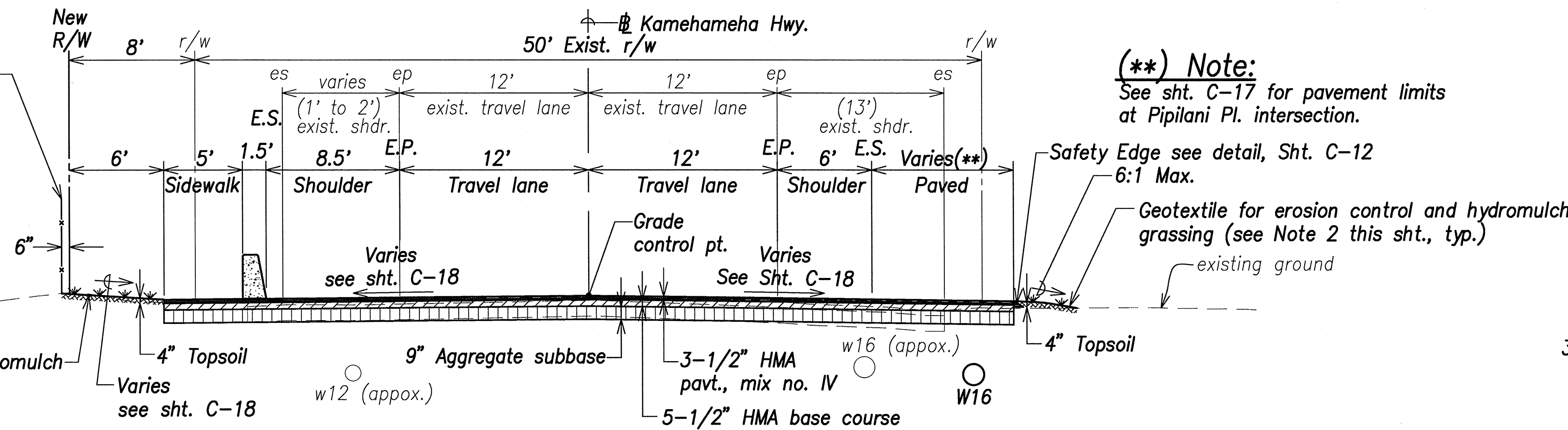
TYPICAL TOP BANK ROUNDING
Not to Scale

GEOTEXTILE FOR EROSION CONTROL
Not to Scale



| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 16 | 161 |

6' High chain link fence begin at Sta. 1248+67.68 see sht. C-9, C-20 & std. plan D-03

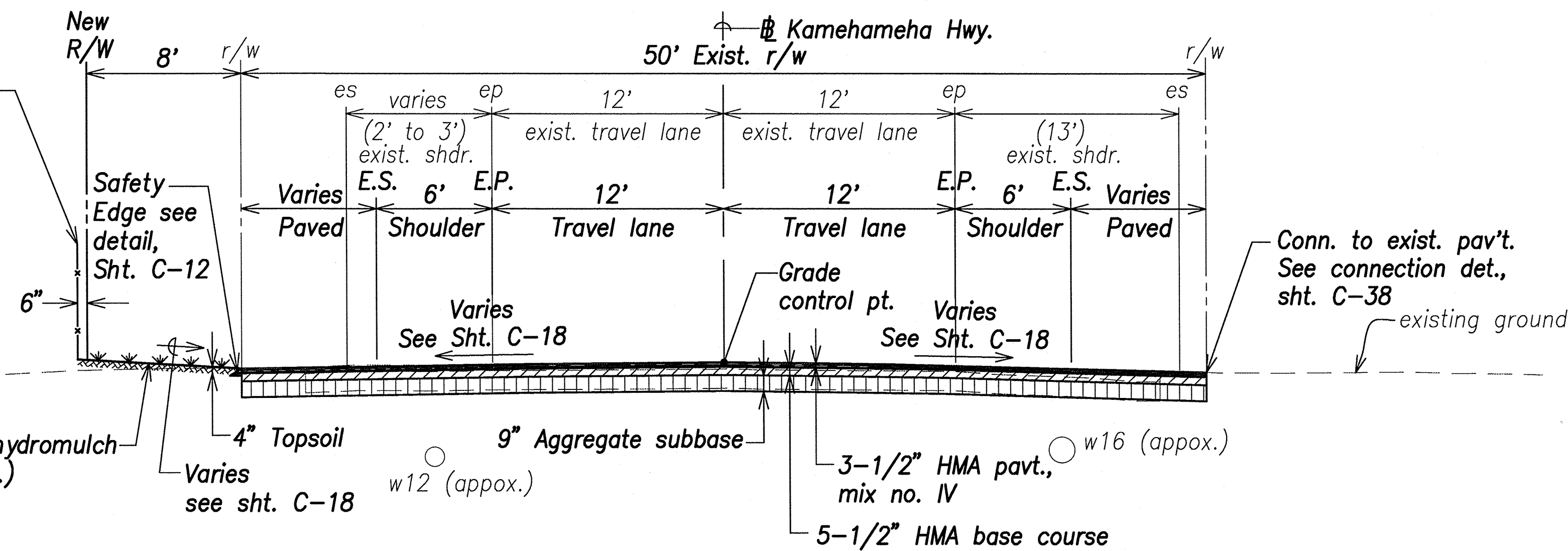


(**) Note:
See sht. C-17 for pavement limits at Pipilani Pl. intersection.

TYPICAL SECTION - (Sta. 1248+67.68 to Sta. 1249+02.17)
Scale: 1"=5'

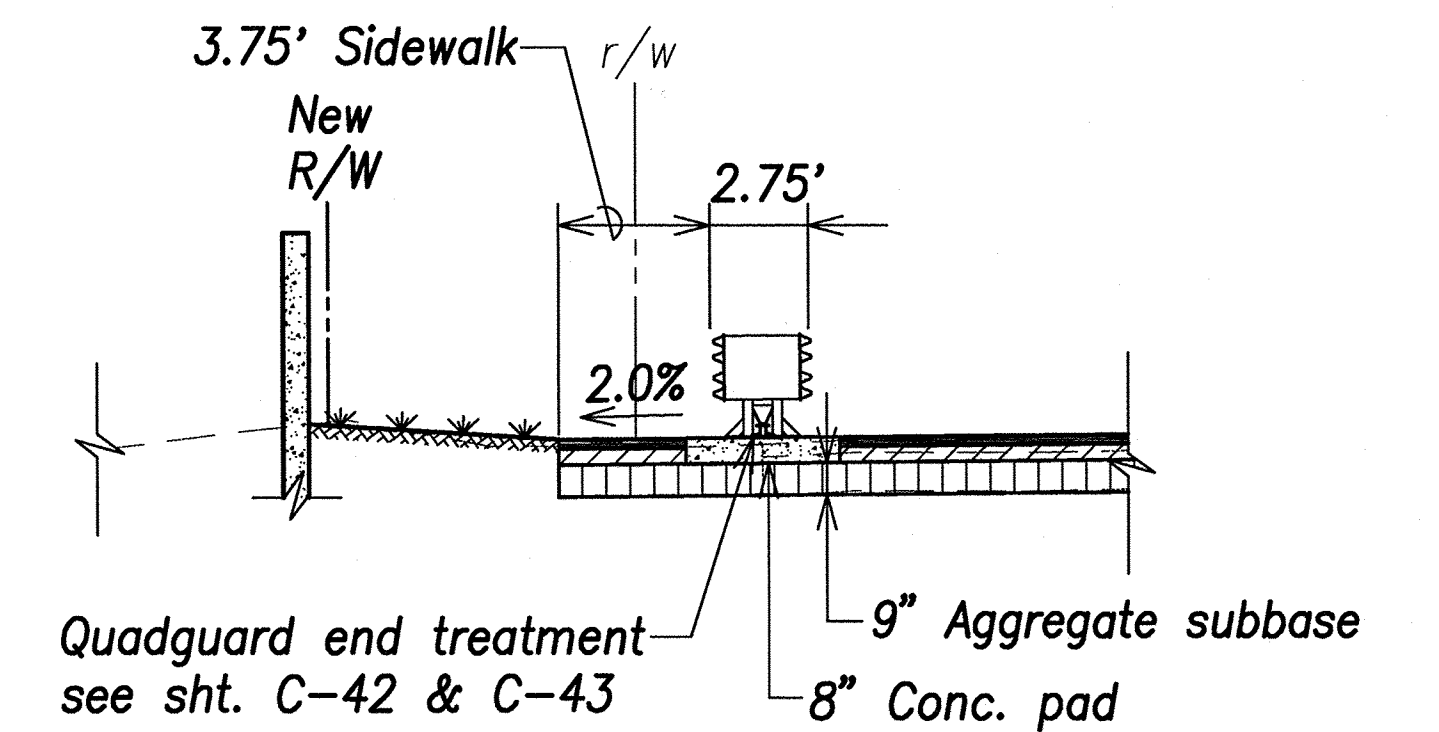
Geotextile for erosion control and hydromulch grassing (see Note 2 this sht., typ.)

6' High chain link fence see sht. C-9, C-20 & std. plan D-03



TYPICAL SECTION - (Sta. 1249+02.17 to Sta. 1249+15.98)
Scale: 1"=5'

Geotextile for erosion control and hydromulch grassing (see Note 2 this sht., typ.)



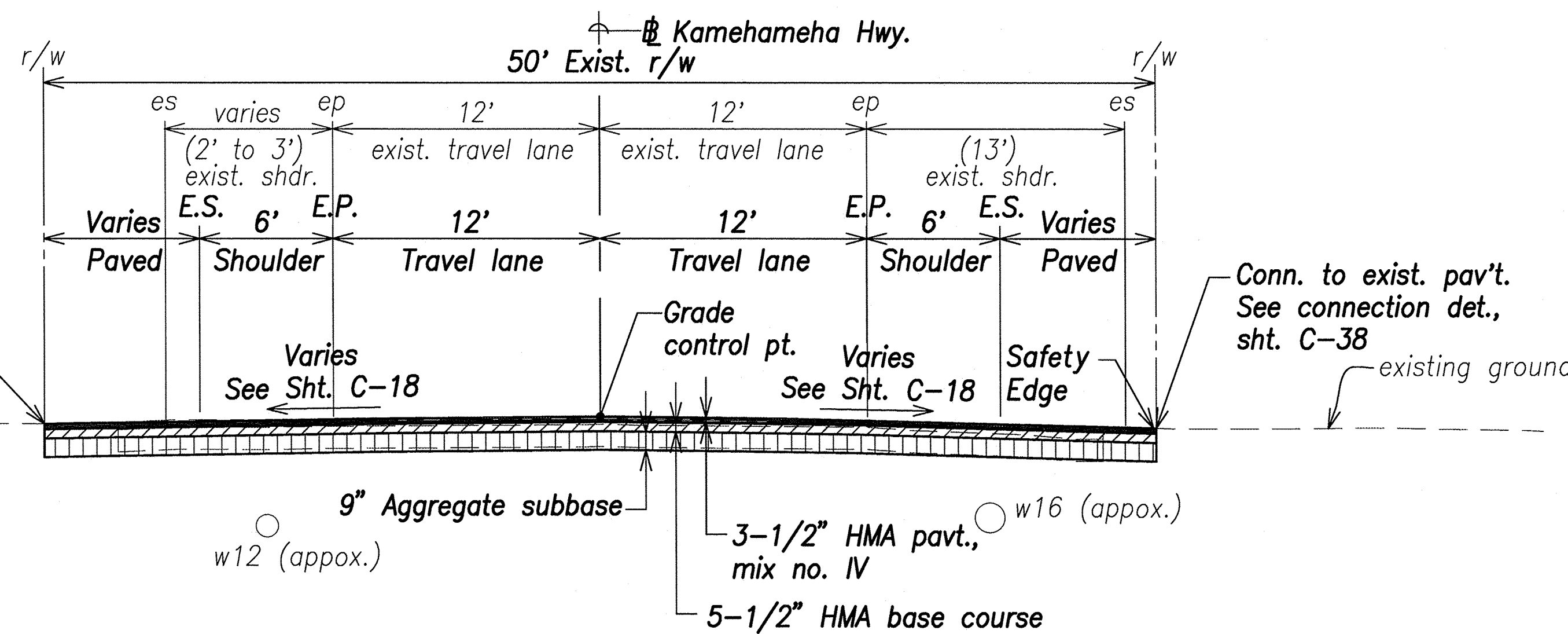
TYPICAL QUADGUARD SECTION
(Sta. 1248+83.19 to Sta. 1249+02.17)
Scale: 1"=5'

Notes:

1. The Contractor shall photo document the existing landscaping in all adjacent residential lots affected by the project and submit to the engineer. Upon completion of major work items, the Contractor shall restore landscaping back to existing condition or better.
2. Hydromulch Grassing. The Contractor shall broadcast sprigs of seashore paspalum at 10 bushels per 1,000 SF capped with hydromulch at 30 lbs per 1,000 SF.

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| SURVEY PROVIDED BY | DATE |
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| DESIGNED BY | |
| QUANTITIES BY | |
| CHECKED BY | |
| ORIGINAL PLAN | |
| NOTE BOOK | |
| No. | |

Conn. to exist. pav't. See connection det., sht. C-38



TYPICAL SECTION - (Sta. 1249+15.98 to Sta. 1249+65)
Scale: 1"=5'

WALTER G. C. CHANG
LICENSED PROFESSIONAL ENGINEERS
No. 8882-C
HAWAII, U.S.A.

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W.G.C. 4/30/22
SIGNATURE LIC. EXPIRATION
R. M. TOWILL CORPORATION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

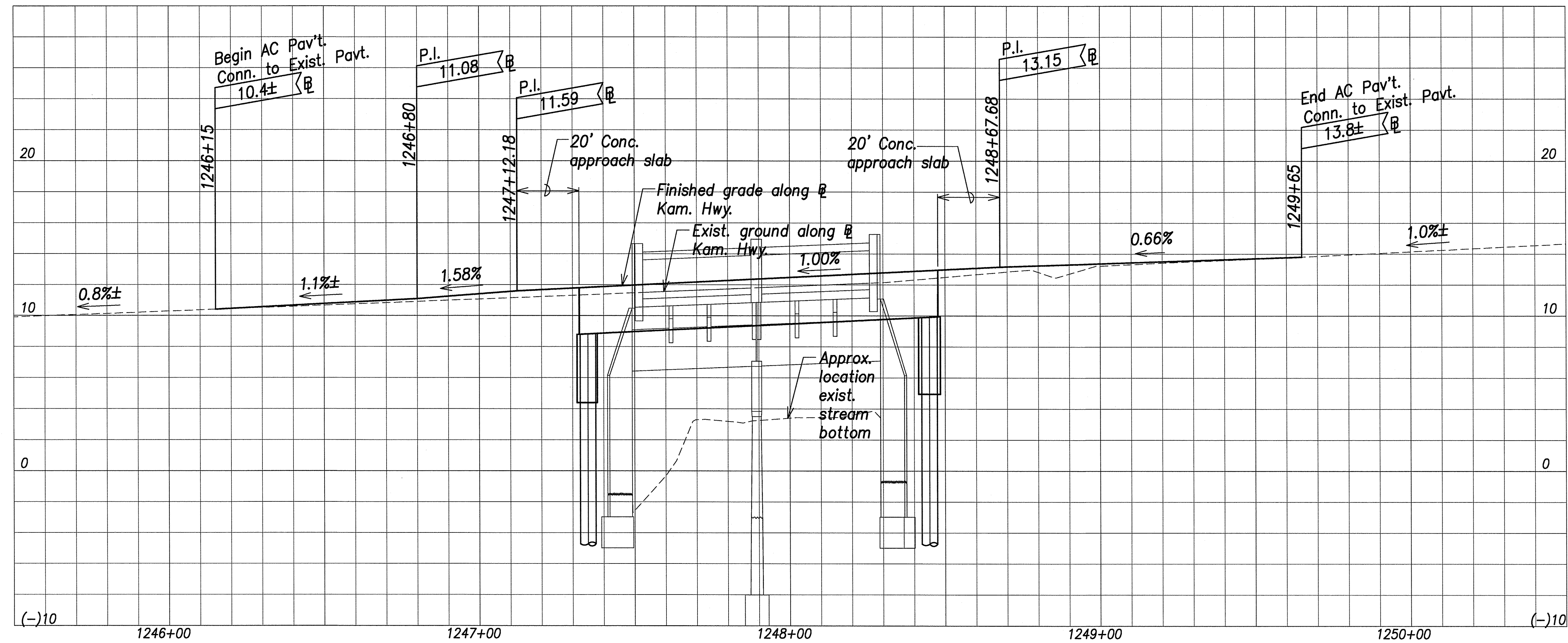
TYPICAL SECTIONS - 3

*Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)*

Scale: As Noted Date: February 2021

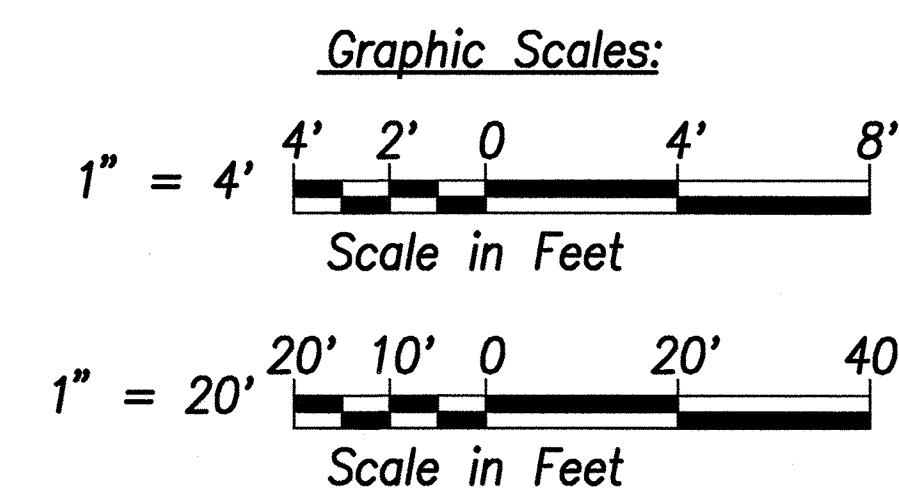
SHEET No. C-14 OF SHEETS

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 17 | 161 |



PROFILE: KAMEHAMEHA HIGHWAY
 Scales: 1"=20' Horiz.
 1"=4' Vert.

| | |
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| SURVEY PLOTTED BY | DATE |
| DRAWN BY | |
| TRACED BY | |
| DESIGNED BY | |
| CHECKED BY | |
| NO. _____ | |



WALTER G. C. CHONG
 LICENSED PROFESSIONAL ENGINEERS
 No. 8882-C
 HAWAII, U.S.A.

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Signature: *Walter G. C. Chong* 4/20/22
 R. M. TOWILL CORPORATION LIC. EXPIRATION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

PROFILE KAMEHAMEHA HWY.

Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

Scale: As Noted Date: February 2021

Phasing Note:

Contractor shall submit a phasing plan and schedule for demolition work to the State Engineer for review and approval. Contractor shall be responsible for providing temporary traffic controls, temporary pavement transitions, notifying affected residences of the work schedule and providing safe temporary access at all times to driveways and streets. Continuous two way traffic shall be maintained at all times. Contra-flow of traffic is allowable provided both lanes of traffic are opened at the end of the work day. Work shall be considered incidental to various items of work.

(* Note:

Demolition work of stream retaining walls shall be done between May and September. The contractor shall be responsible for stabilizing the stream bank to ensure damage to the Kamehameha Highway and the surrounding facilities does not occur. Temporary stream bank stabilization shall be considered incidental to the various items of work.

Exist. Water meters to remain undisturbed
Sawcut and remove exist. a.c. pavt. driveway
Clear and Grub all trees and hedges within 20' radius of utility pgle

Residents will be temporarily relocated during construction by the State. Driveway and house to remain undisturbed.

Demolish and remove CRM and conc. retaining wall (*)

See sht. S2.1 and S2.2 for demolition of exist. bridge, pier and abutments

Sawcut and remove ac pavt. driveway

Emergency work done in 2021 to backfill scour hole with concrete

Demolish and remove conc. retaining wall (*)

Exist. water meters to be relocated, Refer to Shts. C-21 & C-23

Construction parcel
Emergency work done in 2021 to repair wall and backfill area with boulders and concrete

Demolish and remove CMU wall w/ wood fence panels

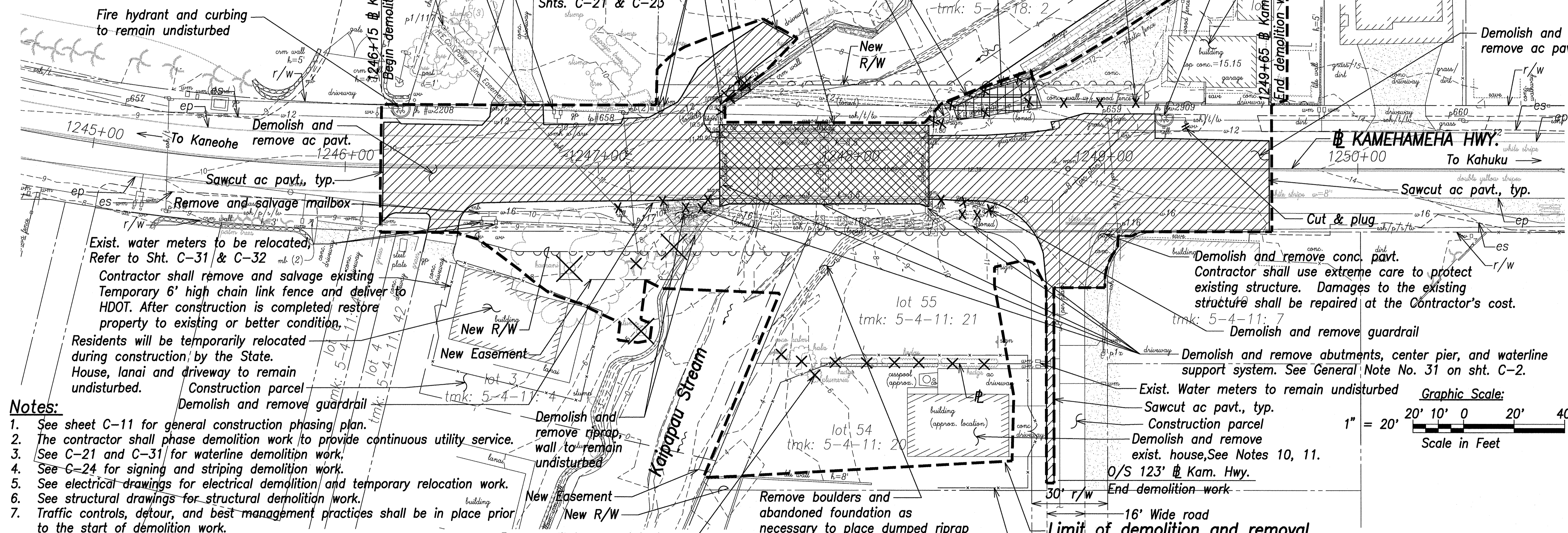
| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 18 | 161 |

Demolish and remove exist. GRP (Approx. 66' long x 12' high x 6" thick)
Contractor shall remove and salvage existing Temporary 6' high chain link fence and deliver to HDOT. After construction is completed Contractor shall install 8ft high chain-link fencing with barbed wire. See sht. C-20 and std. plan D-03

Demolish and remove fire hydrant, lateral, valve and conc. curb. Refer to Shts. C-21 for phasing

Demolish and remove exist. house & fencing, See Notes 8, 10, 11.

Demolish and remove ac pavt.



Notes:

- See sheet C-11 for general construction phasing plan.
- The contractor shall phase demolition work to provide continuous utility service.
- See C-21 and C-31 for waterline demolition work.
- See C-24 for signing and striping demolition work.
- See electrical drawings for electrical demolition and temporary relocation work.
- See structural drawings for structural demolition work.
- Traffic controls, detour, and best management practices shall be in place prior to the start of demolition work.
- The contractor shall demolish and remove everything within the Limit of Demolition and Removal unless otherwise indicated to remain.
- See General Note No. 30 on sht. C-2.
- After the removal of the existing structures, contractor shall be responsible for capping the existing sewer line within the lot. This work shall be considered incidental to the various contract items and will not be paid for separately.
- Contractor shall drain the existing cesspool completely, remove the top & pipes coming into the cesspool, and backfill with CLSM. All permits and approvals for proper disposal of sanitary waste shall be considered incidental and shall be the responsibility of the Contractor. Work shall be paid under 202.0600.
- The contractor shall backfill lots after demolishing houses to match adjacent grades. Stabilize lots with hydromulch seeding.

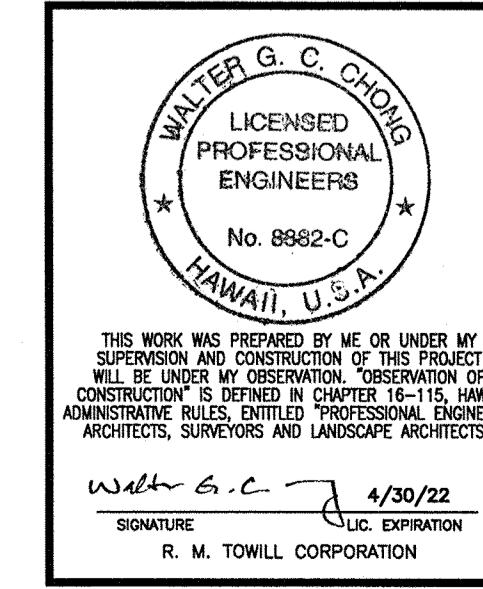
Bridge Note:

The contractor shall perform photographic documentation of the existing Kaipapau Stream bridge acceptable to the State Historic Preservation Division (SHPD) prior to the start of bridge demolition. Work shall be considered incidental to the various items of work.

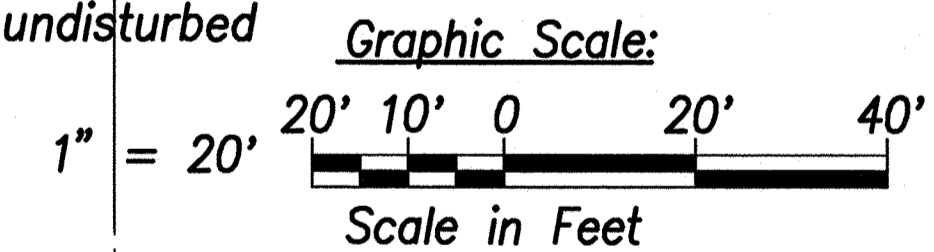
EXISTING CONDITION & DEMOLITION PLAN

Scale: 1"=20'

APPROVED: *[Signature]* MAY 24 2021
DATE
Manager and Chief Engineer, BWS (for work affecting BWS facilities State R/W & BWS easements only)



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
EXISTING CONDITION & DEMOLITION PLAN
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)
Scale: As Noted Date: February 2021
SHEET No. C-16 OF SHEETS



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| DESIGNED BY | DATE |
| CHECKED BY | DATE |
| QUANTITIES BY | DATE |
| NOTED BY | DATE |
| GENERAL PLAN | NO. |

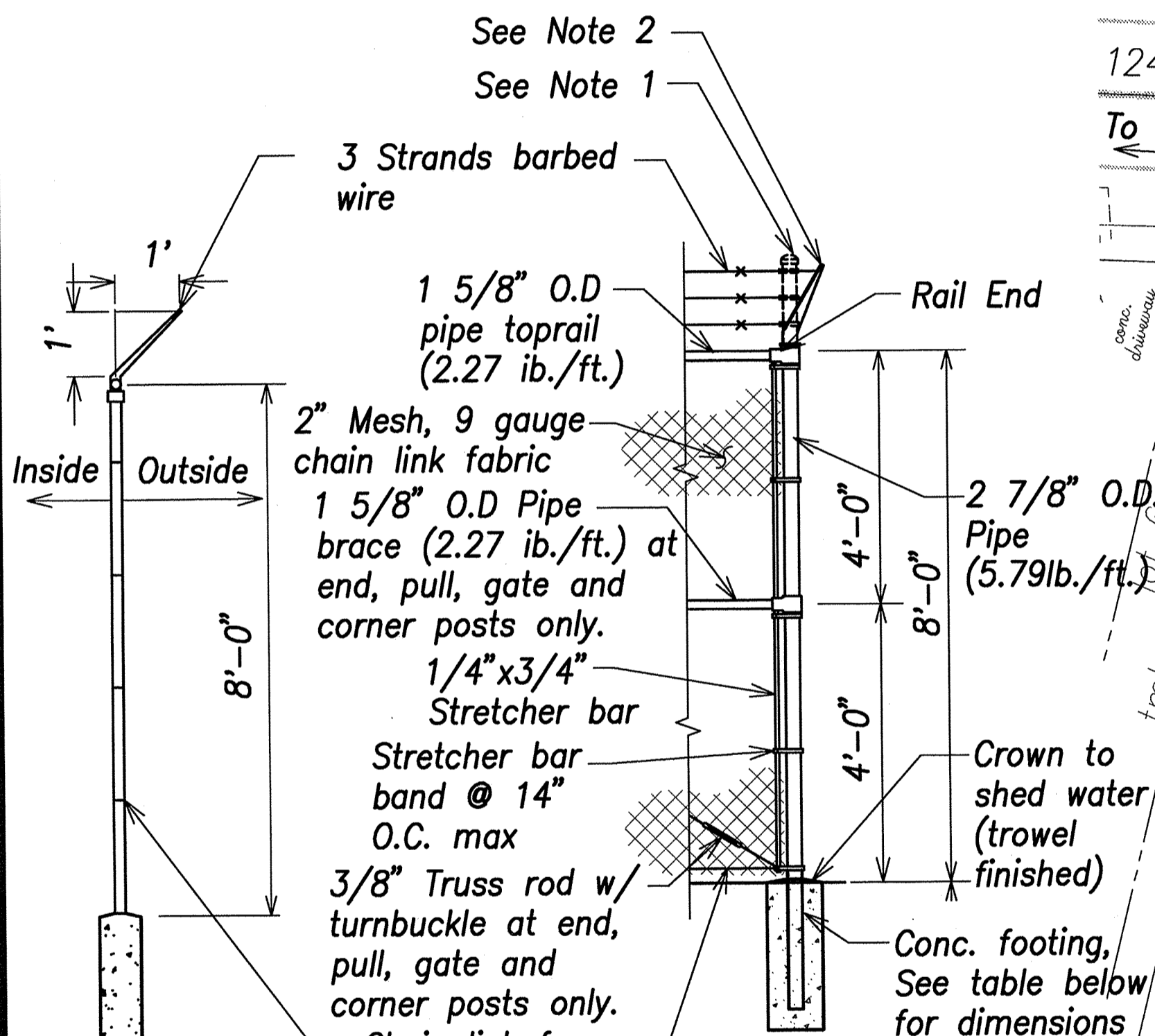
| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 19 | 161 |

Pavement Note:

Contractor shall submit a pavement phasing plan and schedule for the AC pavement work to the State Engineer for review and approval. Contractor shall be responsible for providing temporary traffic controls, temporary pavement transitions, notifying affected residences of the work schedule and providing safe temporary access at all times to driveways and streets. Continuous two way traffic shall be maintained at all times. Work shall be considered incidental to various items of work.

Barbed Wire Note:

1. At fence end only, exclude barbed wire extension arm and extend post. Fasten Barbed wire to post.
2. Point extension outward or away from property line at an angle of 45° from vertical



SECTION

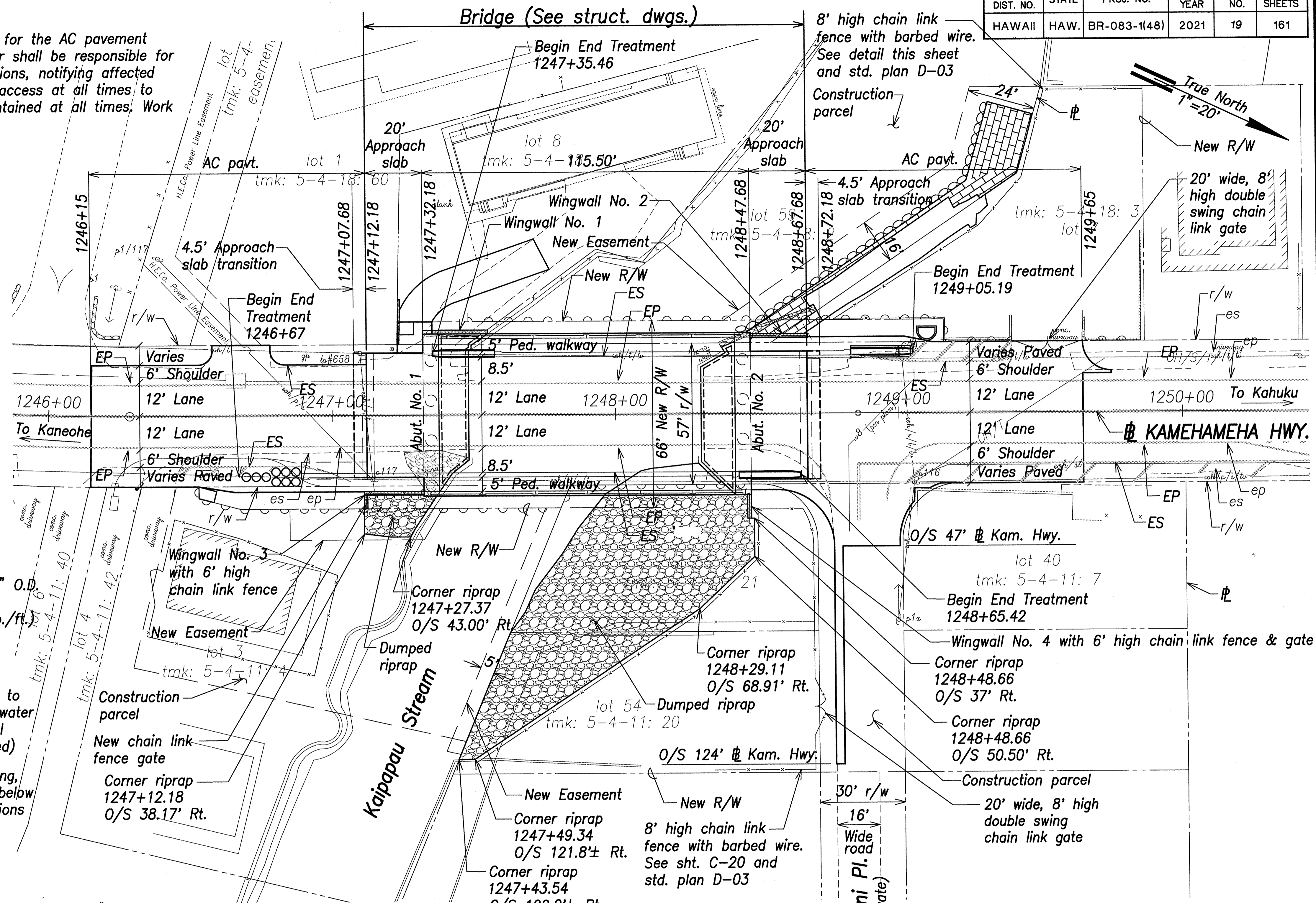
ELEVATION

Fence Post Footing

| Height of Fence | Soil Type: Sand Gravel Minimum Depth of Footing | | Soil Type: Stiff Clay Minimum Depth of Footing | | Soil Type: Rock Minimum Depth of Footing | | Minimum Footing Diameter | |
|-----------------|--|----------------------------------|---|----------------------------------|---|----------------------------------|--------------------------|----------------------------------|
| | Line Post | Corner, Pull, End and Gate Posts | Line Post | Corner, Pull, End and Gate Posts | Line Post | Corner, Pull, End and Gate Posts | Line Post | Corner, Pull, End and Gate Posts |
| 8'-0" | 4'-0" | 4'-6" | 4'-0" | 4'-0" | 1'-6" | 1'-6" | 12" | 24" |

DETAIL - 8' CHAIN LINK FENCE WITH BARBED WIRE

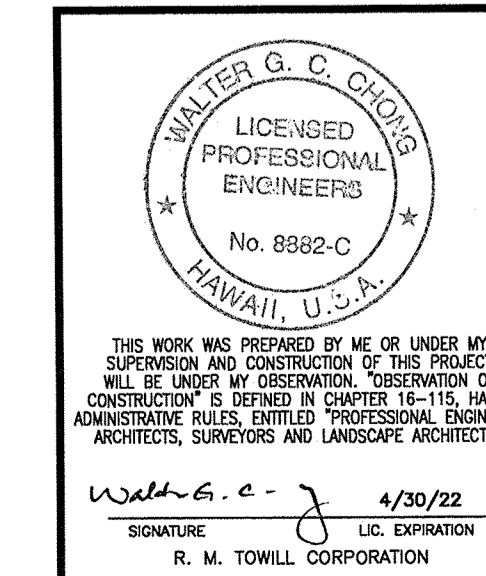
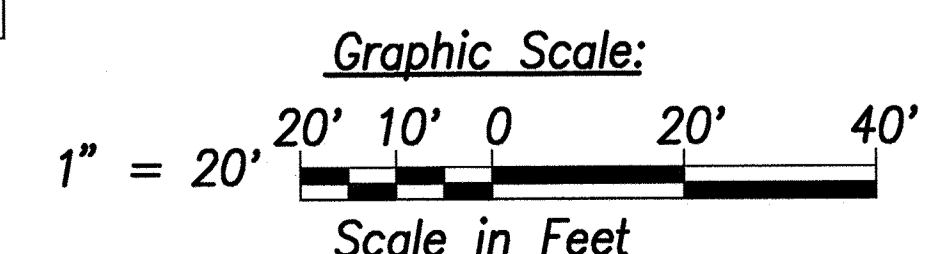
SCALE 1"=2'



SITE LAYOUT PLAN

SCALE 1"=20'

Legend:



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

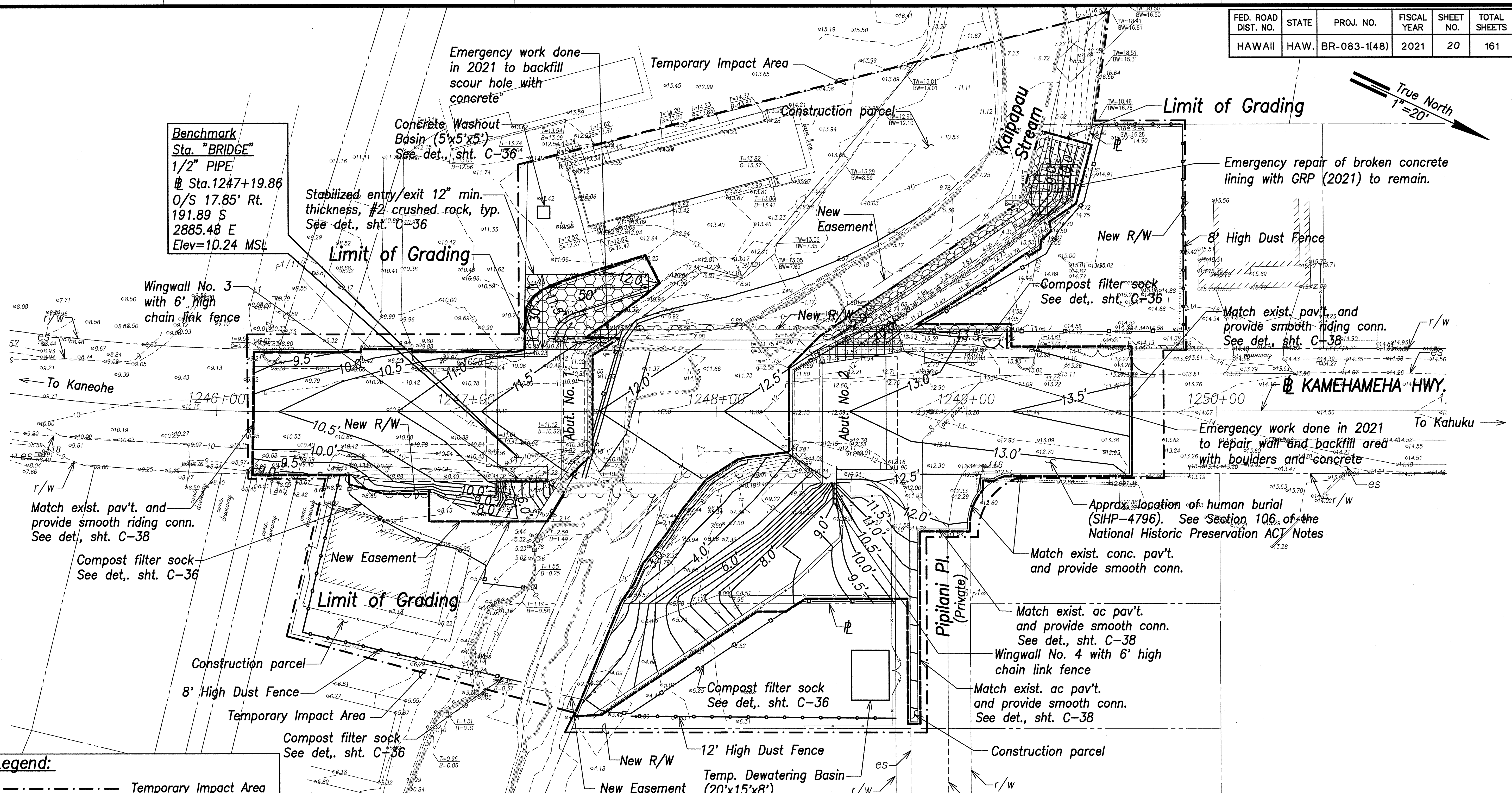
SITE LAYOUT PLAN

*Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)*

Scale: As Noted Date: February 2021

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| DESIGNED BY | DATE |
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| QUANTITIES BY | |
| ORIGINAL PLAN | |
| NOTE BOOK | |
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| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 20 | 161 |



Benchmark Sta. "BRIDGE"
 1/2" PIPE
 @ Sta. 1247+19.86
 O/S 17.85' Rt.
 191.89 S
 2885.48 E
 Elev=10.24 MSL

Stabilized entry/exit 12" min. thickness, #2 crushed rock, typ. See det., sht. C-36

Wingwall No. 3 with 6' high chain link fence

Match exist. pav't. and provide smooth riding conn. See det., sht. C-38

Compost filter sock See det., sht. C-36

Limit of Grading

Construction parcel
 8' High Dust Fence

Temporary Impact Area
 Compost filter sock See det., sht. C-36

New R/W
 12' High Dust Fence

Temp. Dewatering Basin (20'x15'x8')

Match exist. conc. pav't. and provide smooth conn.

Match exist. ac pav't. and provide smooth conn. See det., sht. C-38

Match exist. ac pav't. and provide smooth conn. See det., sht. C-38

Construction parcel

Approx. location of human burial (SIHP-4796). See Section 106 of the National Historic Preservation Act Notes

Emergency repair of broken concrete lining with GRP (2021) to remain.

Match exist. pav't. and provide smooth riding conn. See det., sht. C-38

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete

KAMEHAMEHA HWY.

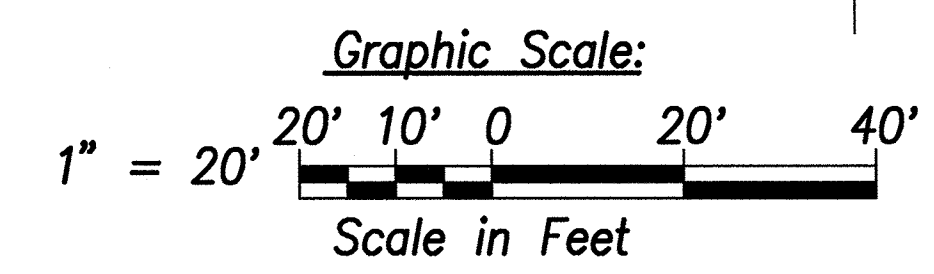
Legend:

- Temporary Impact Area
- - - - - 10 --- Exist. Ground Contour
- 10 — Finished Grade Contour
- Limit of Grading
- o — o — o — Dust Fence
- □ — □ — □ — Compost Filter Sock
- Top of Bank
- Bottom of Bank
- Fill Condition
- Cut Condition
- ← Drainage Flow Direction
- Stabilized Entry/Exit

Notes:

1. For additional finished grade elevations, see sht. C-20.
2. For bridge deck elevations, see structural drawings.
3. For grading work under bridge, see sht. C-19.
4. The contractor shall be responsible for obtaining grading permit from the City and County of Honolulu, Department of Planning and Permitting.
5. Sediment and Erosion Control BMP measures shown in the Contract Documents are minimum BMPs requirements and do not constitute an acceptable and/or complete Sediment and Erosion Control Plan. The Contractor shall incorporate additional BMPs based upon their means and methods considering site conditions and construction sequence in accordance with the Contract Documents including applicable permit document requirements. Cost shall be included in Pay Item 209.0100, "Installation, Maintenance, Monitoring, and Removal of BMP."

ROADWAY GRADING, EROSION & SEDIMENT CONTROL PLAN
 Scale: 1"=20'

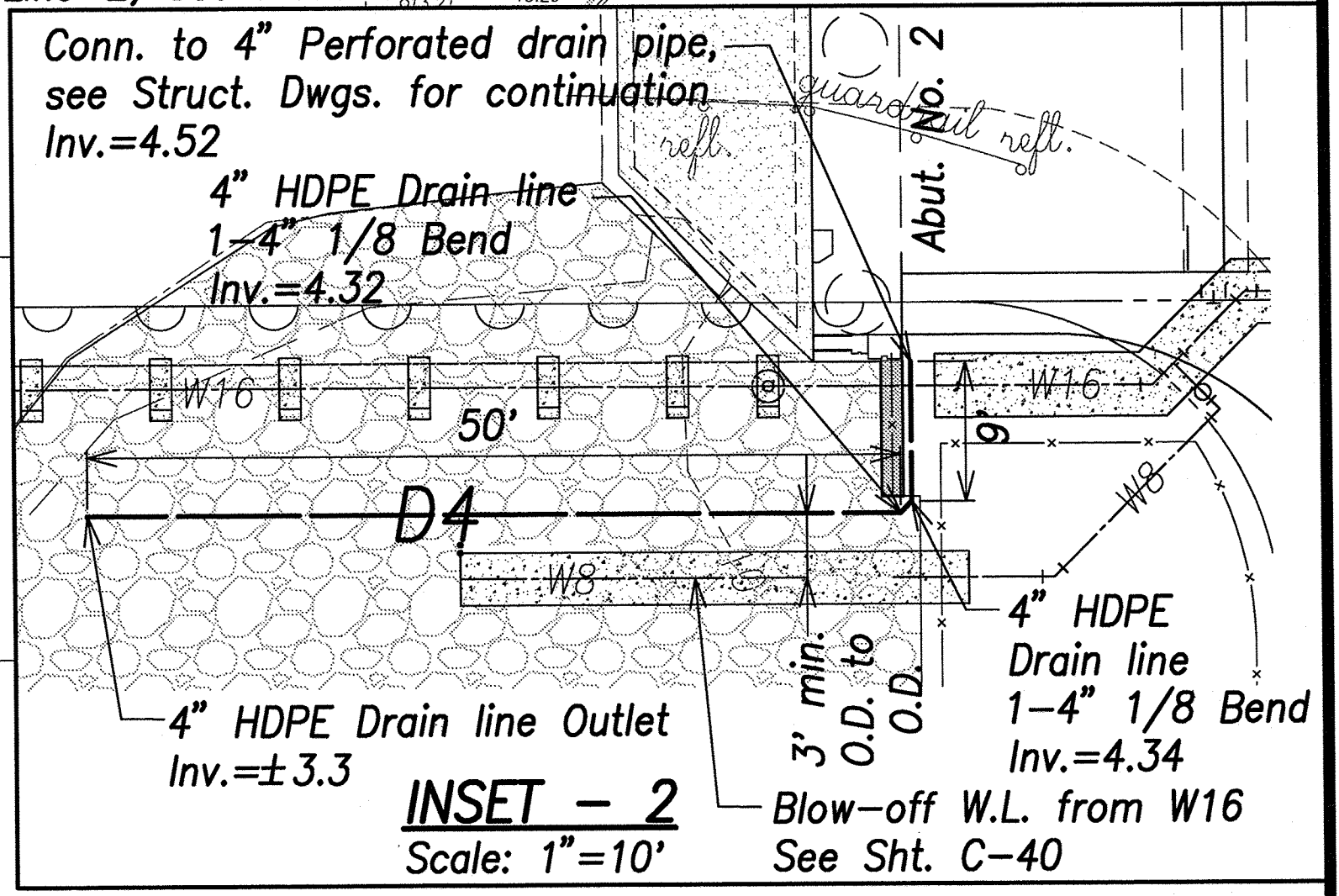
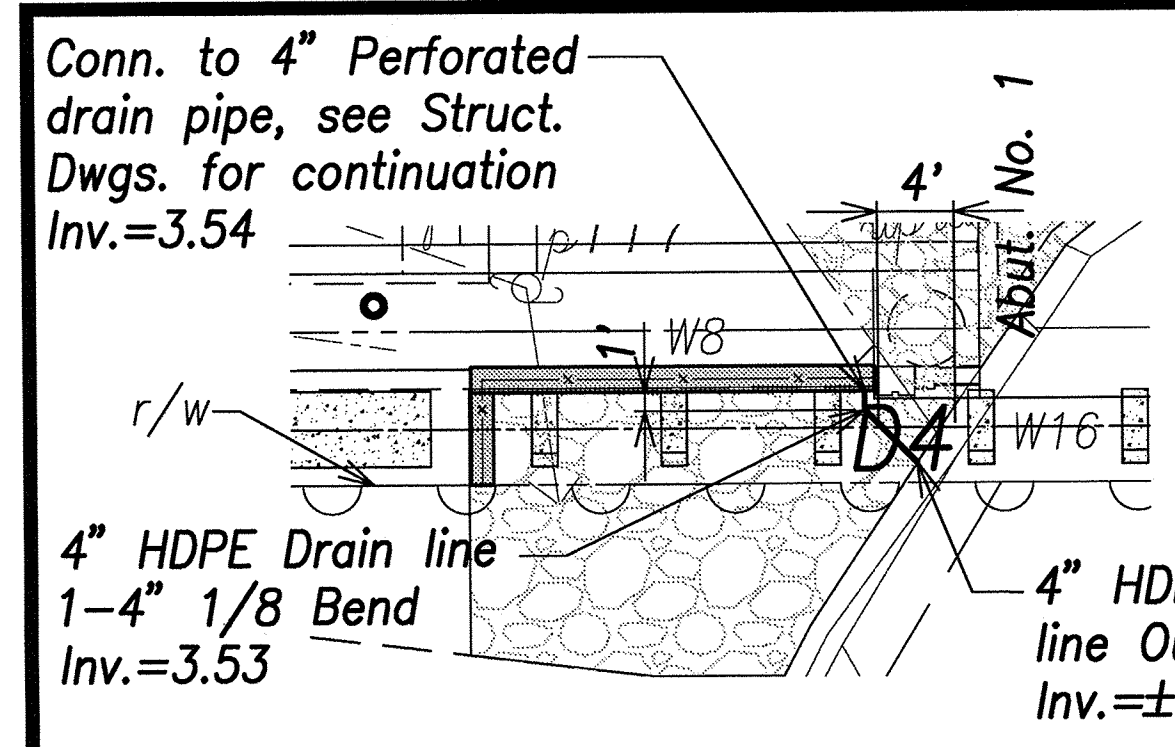
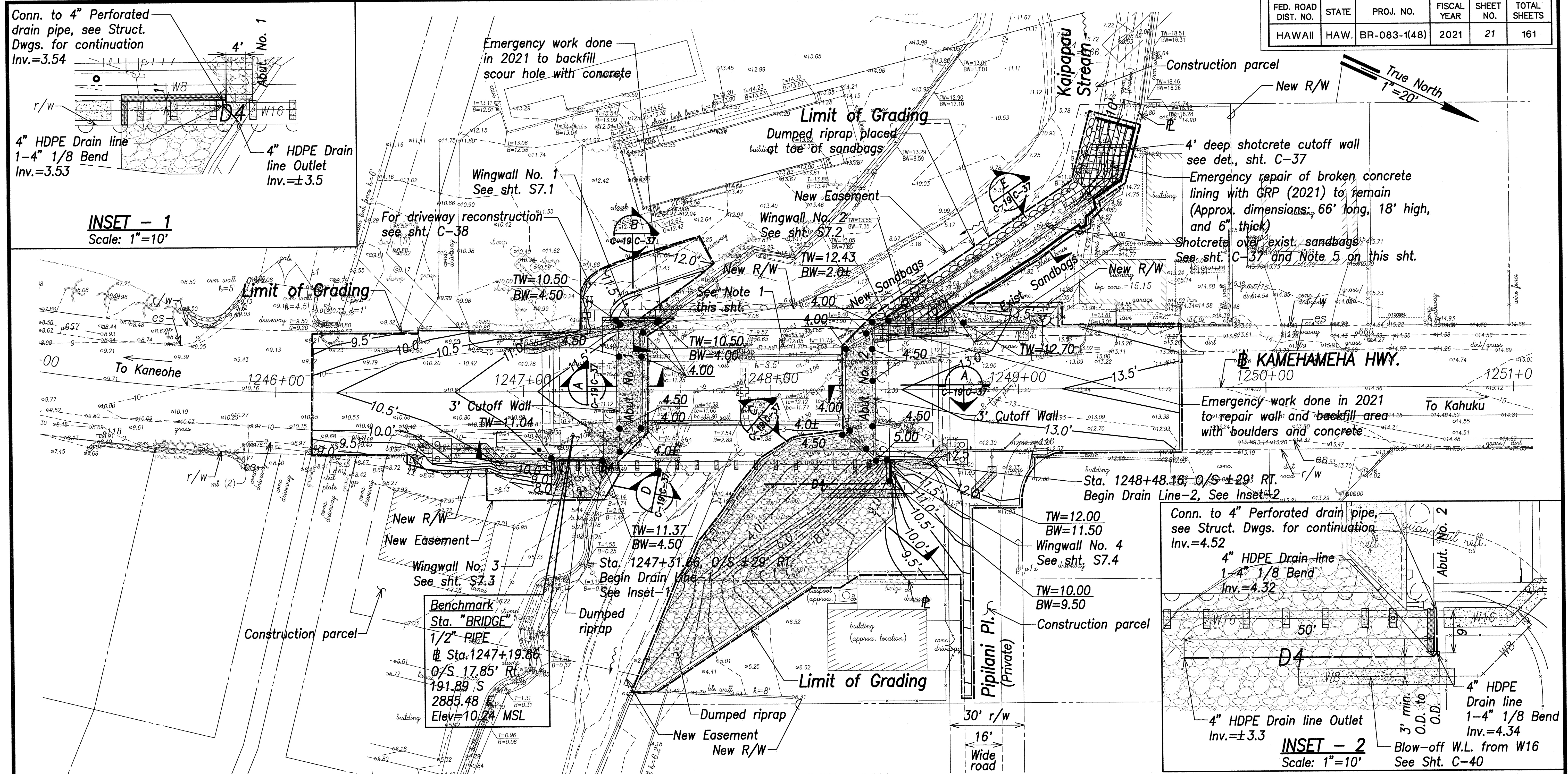


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| DRAWN BY | |
| CHECKED BY | |
| IN CHARGE BY | |
| REVISIONS | |
| NO. | |

WALTER G. C. CHONG
 LICENSED PROFESSIONAL ENGINEER
 No. 8982-C
 HAWAII, U.S.A.
 R. M. TOWILL CORPORATION

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
ROADWAY GRADING, EROSION & SEDIMENT CONTROL PLAN
 Kamehameha Highway
 Kaikapau Stream Bridge Replacement
 Federal Aid Project No. BR-083-1(48)
 Scale: As Noted Date: February 2021
 SHEET No. C-18 OF SHEETS

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 21 | 161 |

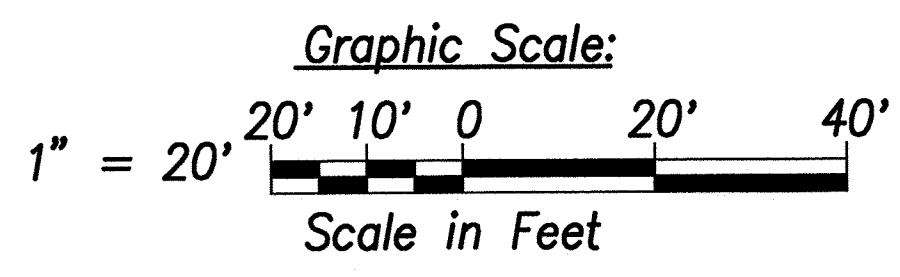


Legend:

- 4.00 Finished spot elevation
- TW=10.79 Top of wall spot elevation
- BW=4.50 Bottom of wall spot elevation
- 10 --- Exist. Ground Contour
- 10.0' --- Finished Grade Contour
- Top of Bank
- Bottom of Bank
- Drainage Flow Direction
- Dumped Riprap

Fill Condition Cut Condition

- Notes:**
- For bridge deck elevations, see sheet S1.6.
 - The contractor shall phase work as required to construct each phase of improvements.
 - All temporary measures required shall be considered incidental to various items of work.
 - See sheet C-18 for temporary stream diversion work.
 - Shotcrete and wall construction shall be done immediately (within one week) after the demolition of the stream walls.
 - Schedule in-stream activities during the dry season and when fair weather conditions are expected.



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| DATE | BY |
| DESIGNED BY | TC |
| QUANTITIES BY | |
| CHECKED BY | |
| ORIGINAL PLAN | |
| NOTE BOOK | |

WALTER G. C. CHONG
 LICENSED PROFESSIONAL ENGINEERS
 No. 8882-C
 HAWAII, U.S.A.

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Walter G. C. Chong
 LIC. EXPIRATION 4/30/22
 R. M. TOWILL CORPORATION

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

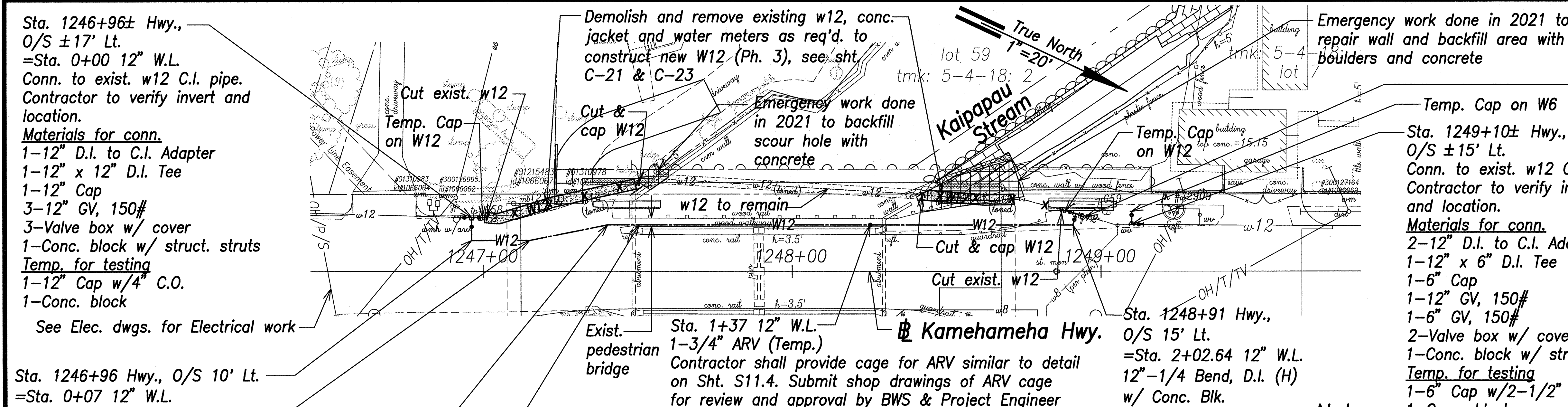
STREAM SITE & GRADING PLAN

*Kamehameha Highway
 Kaipapau Stream Bridge Replacement
 Federal Aid Project No. BR-083-1(48)*

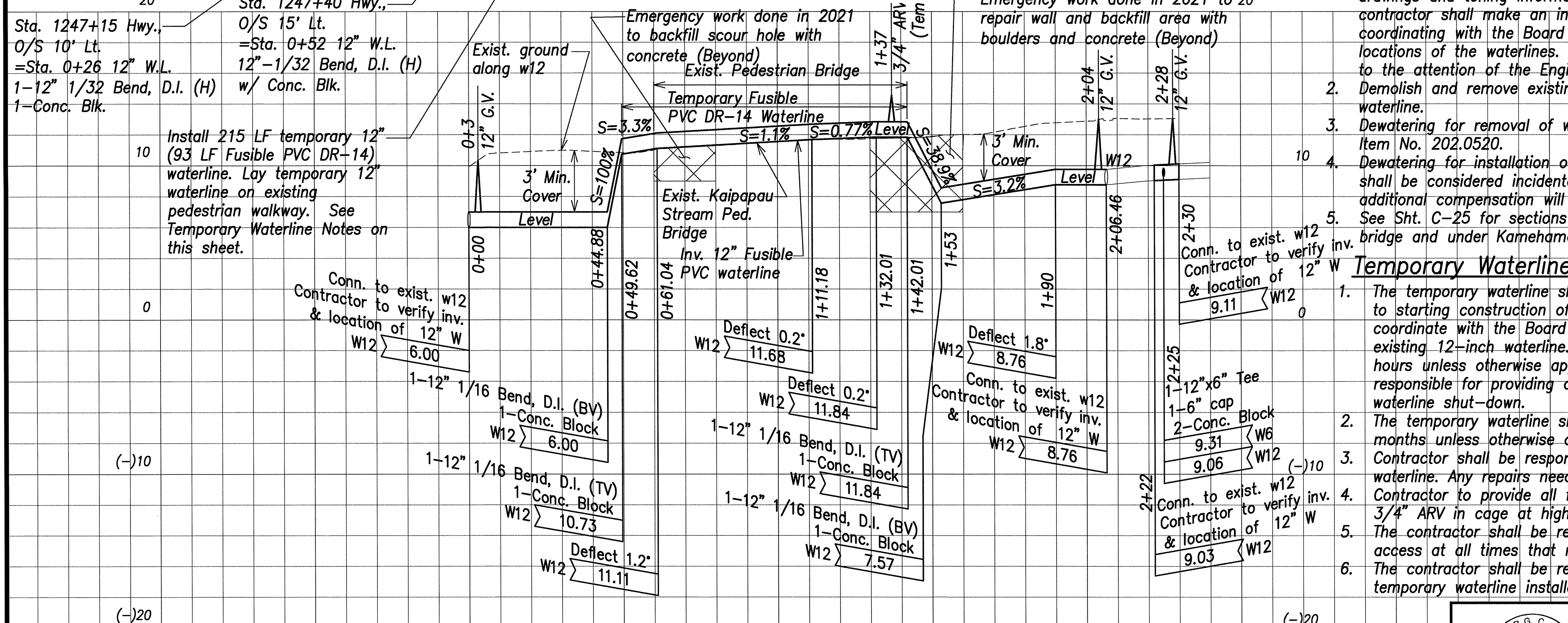
Scale: As Noted Date: February 2021

SHEET No. C-19 OF SHEETS

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 24 | 161 |



12-INCH TEMPORARY WATERLINE PLAN (PHASE 1 & 2)
Scale: 1"=20'



12-INCH TEMPORARY WATERLINE PROFILE (PHASE 1 & 2)
Scales: 1"=20' Horiz. 1"=4' Vert.

Sta. 1246+96± Hwy., O/S ±17' Lt.
=Sta. 0+00 12" W.L.
Conn. to exist. w12 C.I. pipe.
Contractor to verify invert and location.
Materials for conn.
1-12" D.I. to C.I. Adapter
1-12" x 12" D.I. Tee
1-12" Cap
3-12" GV, 150#
3-Valve box w/ cover
1-Conc. block w/ struct. struts
Temp. for testing
1-12" Cap w/4" C.O.
1-Conc. block
See Elec. dwgs. for Electrical work

Sta. 1246+96 Hwy., O/S 10' Lt.
=Sta. 0+07 12" W.L.
1-12" 1/4 Bend, D.I. (H)
1-Conc. Blk.

Sta. 1247+15 Hwy., O/S 10' Lt.
=Sta. 0+26 12" W.L.
1-12" 1/32 Bend, D.I. (H)
1-Conc. Blk.

Sta. 1247+40 Hwy., O/S 15' Lt.
=Sta. 0+52 12" W.L.
12"-1/32 Bend, D.I. (H)
w/ Conc. Blk.

Sta. 1248+91 Hwy., O/S 15' Lt.
=Sta. 2+02.64 12" W.L.
12"-1/4 Bend, D.I. (H)
w/ Conc. Blk.

Sta. 1248+91 Hwy., O/S 15' Lt.
=Sta. 2+02.64 12" W.L.
12"-1/4 Bend, D.I. (H)
w/ Conc. Blk.

Sta. 1248+95± Hwy., O/S ±18' Lt.
Conn. to exist. w12 C.I. pipe.
Contractor to verify invert and location.
Materials for conn.
1-12" D.I. to C.I. Adapter
1-12" x 12" D.I. Tee
1-12" Cap
3-12" GV, 150#
3-Valve box w/ cover
1-Conc. block w/ struct. struts
Temp. for testing
1-12" Cap w/4" C.O.
1-Conc. block

Emergency work done in 2021 to backfill scour hole with concrete

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete

Emergency work done in 2021 to backfill scour hole with concrete (Beyond) Exist. Pedestrian Bridge

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete (Beyond)

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete

Emergency work done in 2021 to backfill scour hole with concrete

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete

Emergency work done in 2021 to backfill scour hole with concrete (Beyond) Exist. Pedestrian Bridge

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete (Beyond)

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete

Emergency work done in 2021 to backfill scour hole with concrete

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete

Emergency work done in 2021 to backfill scour hole with concrete (Beyond) Exist. Pedestrian Bridge

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete (Beyond)

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete

Emergency work done in 2021 to backfill scour hole with concrete

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete

Emergency work done in 2021 to backfill scour hole with concrete (Beyond) Exist. Pedestrian Bridge

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete (Beyond)

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete

Emergency work done in 2021 to backfill scour hole with concrete

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete

Emergency work done in 2021 to backfill scour hole with concrete (Beyond) Exist. Pedestrian Bridge

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete (Beyond)

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete

Notes:

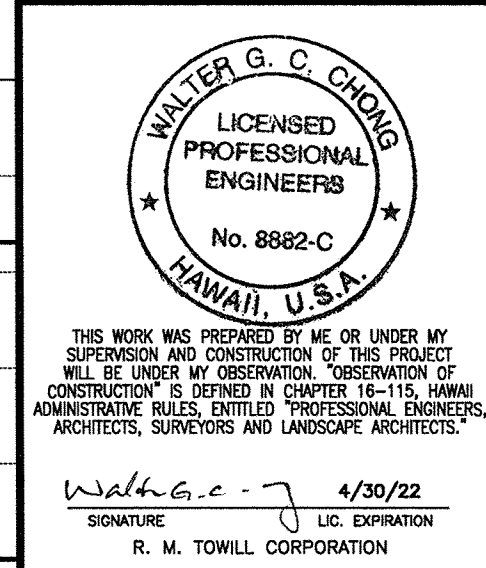
- The existing waterlines shown on these plans were located using record drawings and toning information from the Board of Water Supply. The contractor shall make an independent check by probing the waterlines and coordinating with the Board of Water Supply to ascertain the exact locations of the waterlines. Any discrepancies shall be immediately brought to the attention of the Engineer prior to any work on the water system.
- Demolish and remove existing waterline as required to construct temporary waterline.
- Dewatering for removal of water system shall be considered incidental to Item No. 202.0520.
- Dewatering for installation of the temporary and permanent water system shall be considered incidental to Item No. 624.1003 Water Systems. No additional compensation will be provided for dewatering.
- See Sht. C-25 for sections showing temporary 12" waterline on pedestrian bridge and under Kamehameha Highway.

Temporary Waterline Notes:

- The temporary waterline shall be constructed, tested and in-service prior to starting construction of permanent water system. The contractor shall coordinate with the Board of Water Supply (BWS) for shut-down of the existing 12-inch waterline. The maximum down time shall be six (6) hours unless otherwise approved by the BWS. The contractor shall be responsible for providing advanced notification to all users affected by the waterline shut-down.
- The temporary waterline shall not be in-service for more than two (2) months unless otherwise approved by the BWS.
- Contractor shall be responsible for protecting & maintaining temporary waterline. Any repairs needed shall be coordinated with BWS personnel.
- Contractor to provide all fittings, bends as required and install temporary 3/4" ARV in cage at high point of temporary waterline
- The contractor shall be responsible for providing safe temporary pedestrian access at all times that meets ADA requirements.
- The contractor shall be responsible for providing traffic controls during temporary waterline installation.

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| DESIGNED BY | DATE |
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| QUANTITIES BY | |
| NO. | |

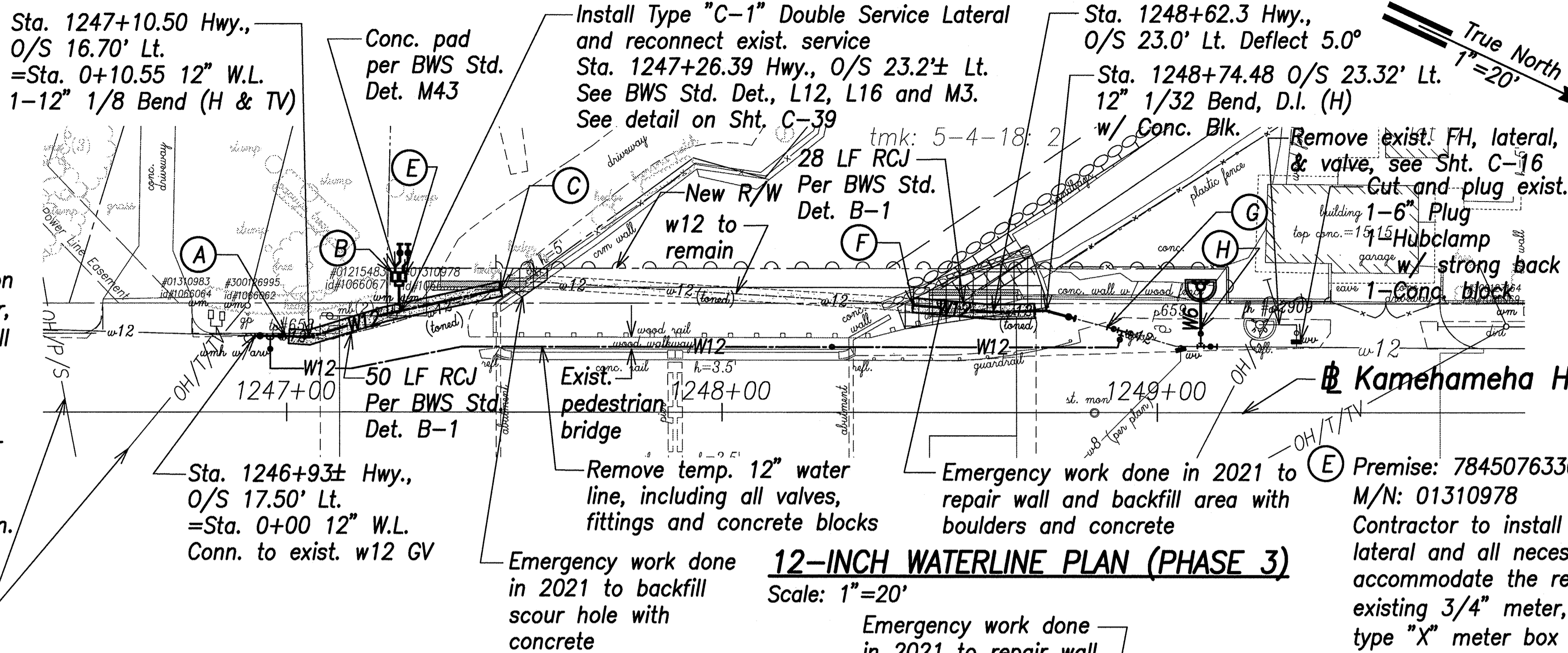
APPROVED: *[Signature]* MAY 24 2021
Manager and Chief Engineer, BWS
(for work affecting BWS facilities State R/W & BWS easements only)



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
12-INCH WATERLINE
PLAN & PROFILE (PHASE 1 & 2)
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)
Scale: As Noted Date: February 2021

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 25 | 161 |

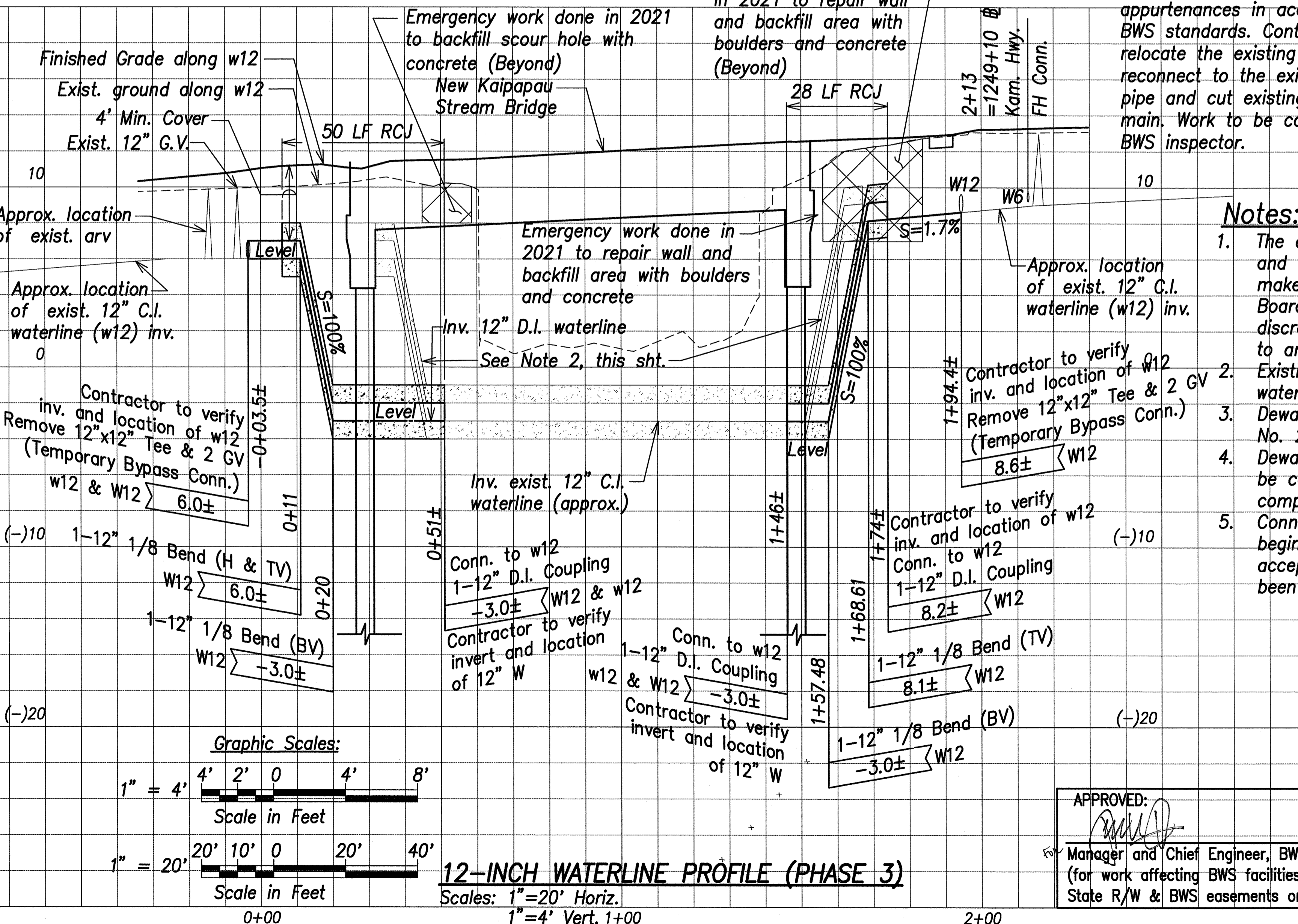
- (A) Sta. 1246+99.7± Hwy., O/S 17.5± Lt. =Sta. 0+00.0± 12" W.L. Deflect 4.0°
- (B) Premise: 6348072596 M/N: 01215483 Contractor to install type "C-1" lateral and all necessary fittings to accommodate the relocation of the existing 5/8" meter, type "X" meter box and all appurtenances in accordance with BWS standards. Contractor to relocate the existing meter and reconnect to the existing property pipe and cut existing lateral at main. Work to be coordinated with BWS inspector. See Elec. dwgs. for Electrical work



- (C) Connect to exist. w12 C.I. pipe Sta. 1247+49.3± Hwy., O/S 28.2± Lt. =Sta. 0+58.0± 12" W.L. 1-12" C.I. to D.I. Adapter Materials for conn. 1-12" Sleeve, 12" long 8± LF 12" D.I.P., Cl. 53 Temp. for testing 1-12" Cap w/4" C.O. 1-Conc. block Contractor to verify invert and location
- (D) Connect to exist. w12 C.I. pipe Sta. 1248+43.9± Hwy., O/S 24.6± Lt. =Sta. 1+53.0± 12" W.L. Materials for conn. 1-12" C.I. TO D.I. adapter 1-12" D.I. Sleeve, 12" long 8± LF 12" D.I.P., Cl. 53 Temp. for testing 1-12" Cap w/4" C.O. 1-Conc. block Contractor to verify invert and location
- (E) Premise: 7845076330 M/N: 01310978 Contractor to install type "C-1" lateral and all necessary fittings to accommodate the relocation of the existing 3/4" meter, type "X" meter box and all appurtenances in accordance with BWS standards. Contractor to relocate the existing meter and reconnect to the existing property pipe and cut existing lateral at main. Work to be coordinated with BWS inspector.
- (F) Connect to exist. w12 C.I. pipe Sta. 1248+71.9± Hwy., O/S 23.3± Lt. =Sta. 2+00± 12" W.L. Materials for conn. 1-12" Sleeve, 12" long 8± LF 12" D.I.P., Cl. 53 1-12" Cap 1-12" D.I. 1/8 Bend (TV) Temp. for testing 1-12" Cap w/4" C.O. 1-Conc. block Contractor to verify invert and location
- (G) Connect to exist. w12 C.I. pipe Sta. 1249+10 Hwy., O/S 15.1± Lt. =Sta. 2+20 12" W.L. 1-6" D.I. 1/4 Bend (BV) 1-New FH (Ht.=6'-4") 1-FH Extension piece 1-FH Marker 1-FH Curb guard 14 LF 6" D.I.P. Cl. 53 1-Conc. block See BWS Std. Det. FH4 and FH11 For Profile, see sht. C-39 Temp. for Testing 1-6" cap w/ 2-1/2" C.O. 1-Conc. block

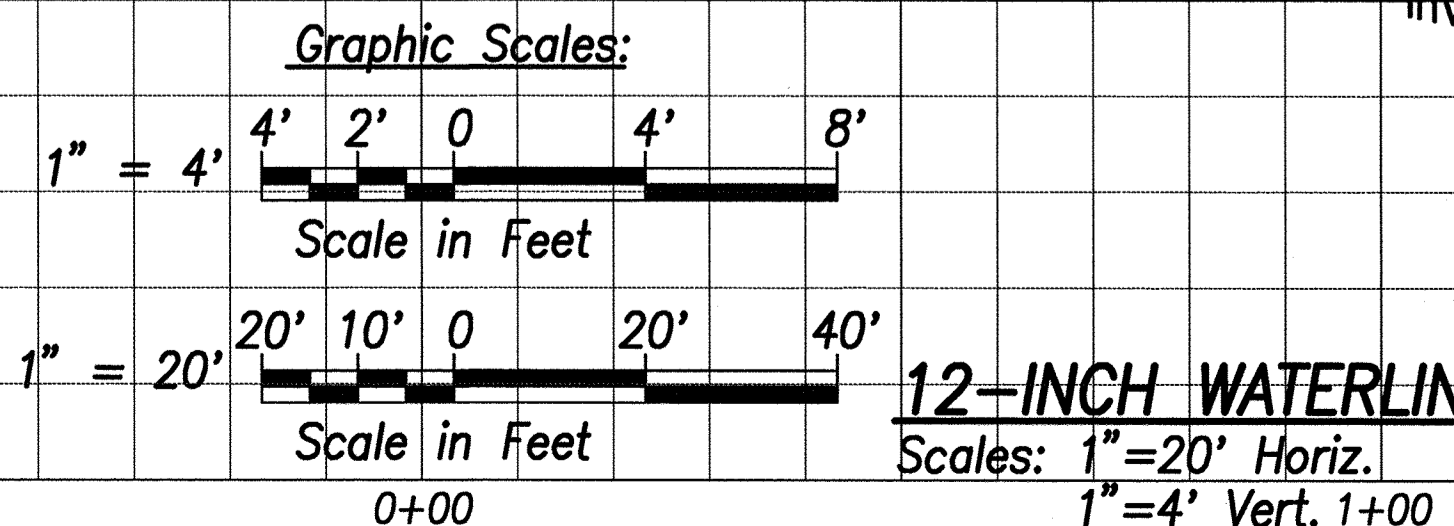
12-INCH WATERLINE PLAN (PHASE 3)
Scale: 1"=20'

- (C) Connect to exist. w12 C.I. pipe Sta. 1247+49.3± Hwy., O/S 28.2± Lt. =Sta. 0+58.0± 12" W.L. 1-12" C.I. to D.I. Adapter Materials for conn. 1-12" Sleeve, 12" long 8± LF 12" D.I.P., Cl. 53 Temp. for testing 1-12" Cap w/4" C.O. 1-Conc. block Contractor to verify invert and location



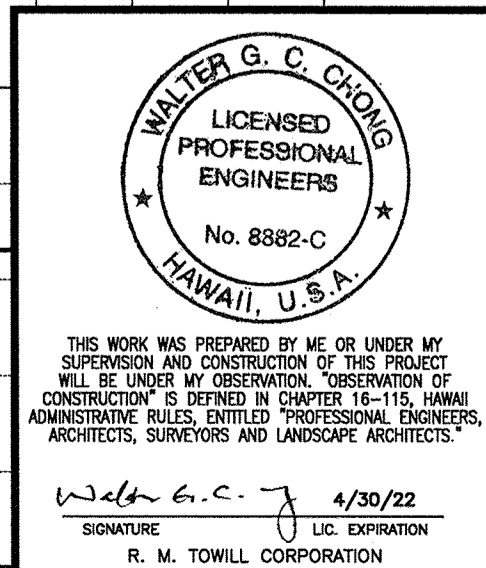
Notes:

- The existing waterlines shown on these plans were located using record drawings and toning information from the Board of Water Supply. The contractor shall make an independent check by probing the waterlines and coordinating with the Board of Water Supply to ascertain the exact locations of the waterlines. Any discrepancies shall be immediately brought to the attention of the Engineer prior to any work on the water system.
- Existing waterline removed in Phase 2 as required to construct permanent waterline.
- Dewatering for removal of water system shall be considered incidental to Item No. 202.0520.
- Dewatering for installation of the temporary and permanent water system shall be considered incidental to Item No. 624.1003 Water Systems. No additional compensation will be provided for dewatering.
- Connection of the temporary 16" waterline to the existing 16" waterline cannot begin until after the permanent 12" waterline has been pressure tested, accepted by BWS and placed into service and the temporary 12" waterline has been removed.



12-INCH WATERLINE PROFILE (PHASE 3)
Scales: 1"=20' Horiz. 1"=4' Vert. 1+00

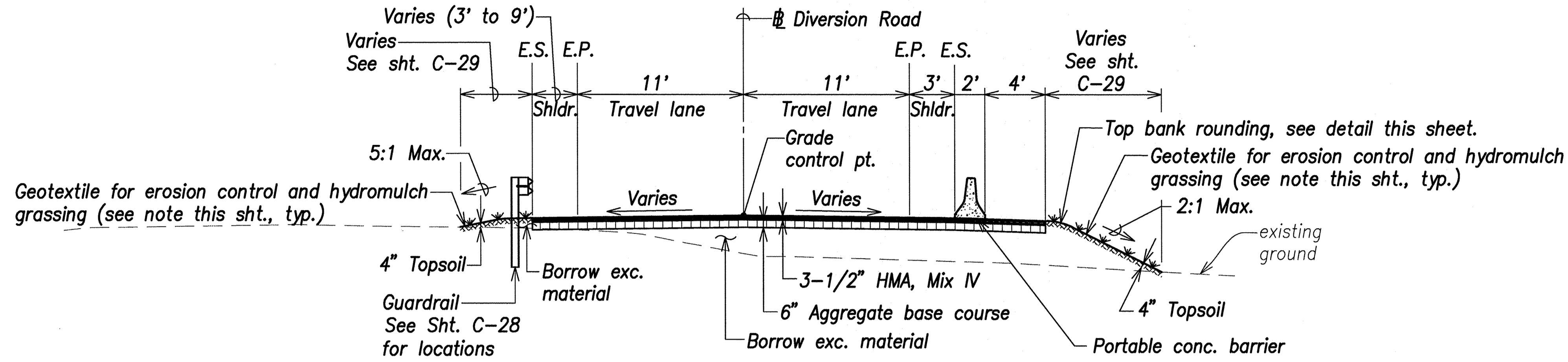
APPROVED: *[Signature]* MAY 24 2021
Manager and Chief Engineer, BWS
(for work affecting BWS facilities State R/W & BWS easements only)



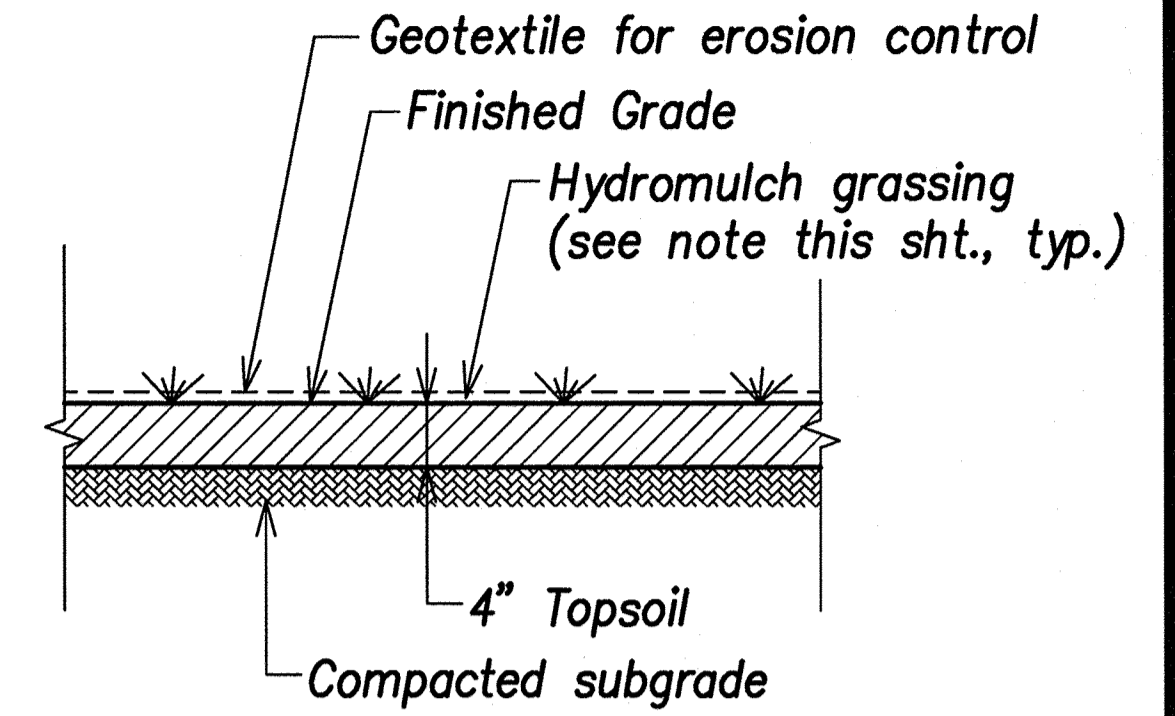
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**12-INCH WATERLINE
PLAN & PROFILE (PHASE 3)**
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)
Scale: As Noted Date: February 2021

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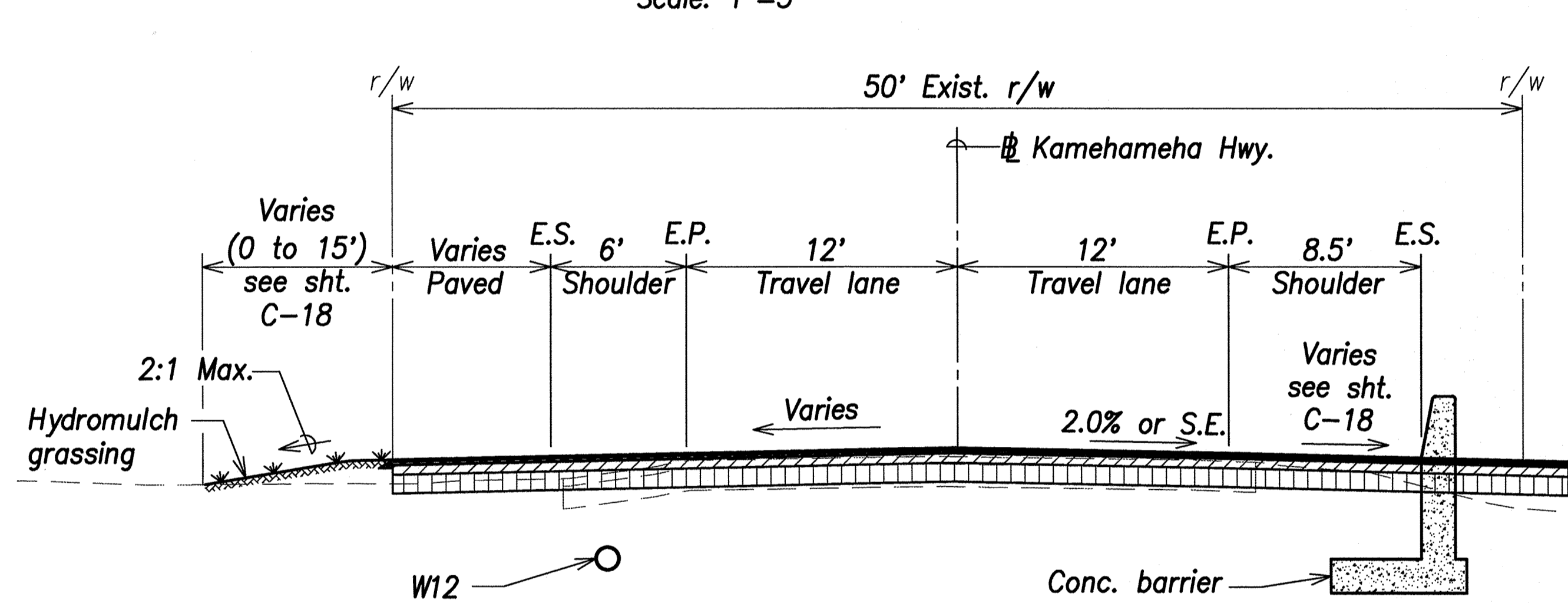
| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 27 | 161 |



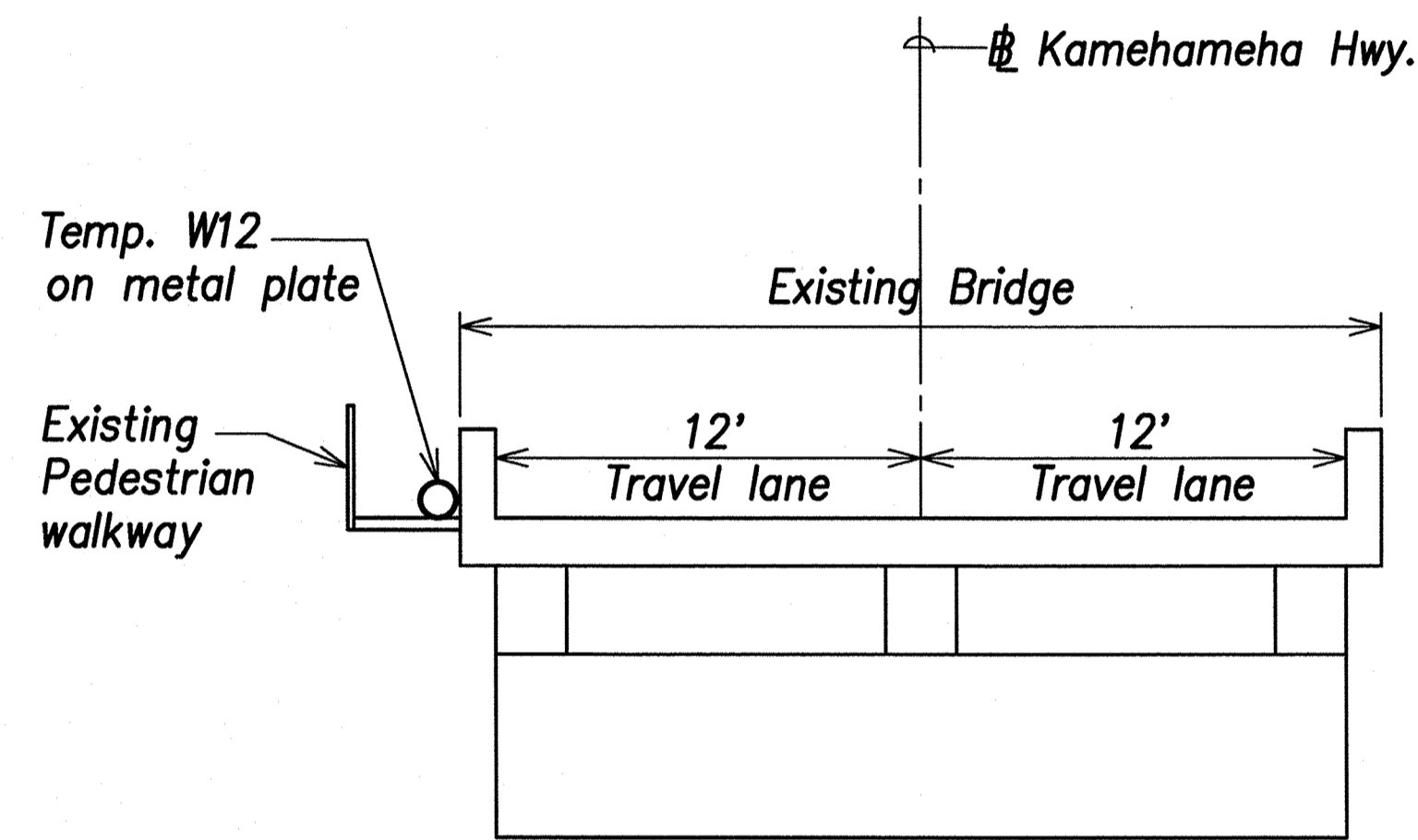
TYPICAL SECTION - (Diversion Rd. Sta. 0+34.41 to Diversion Rd. Sta. 0+60)
Scale: 1"=5'



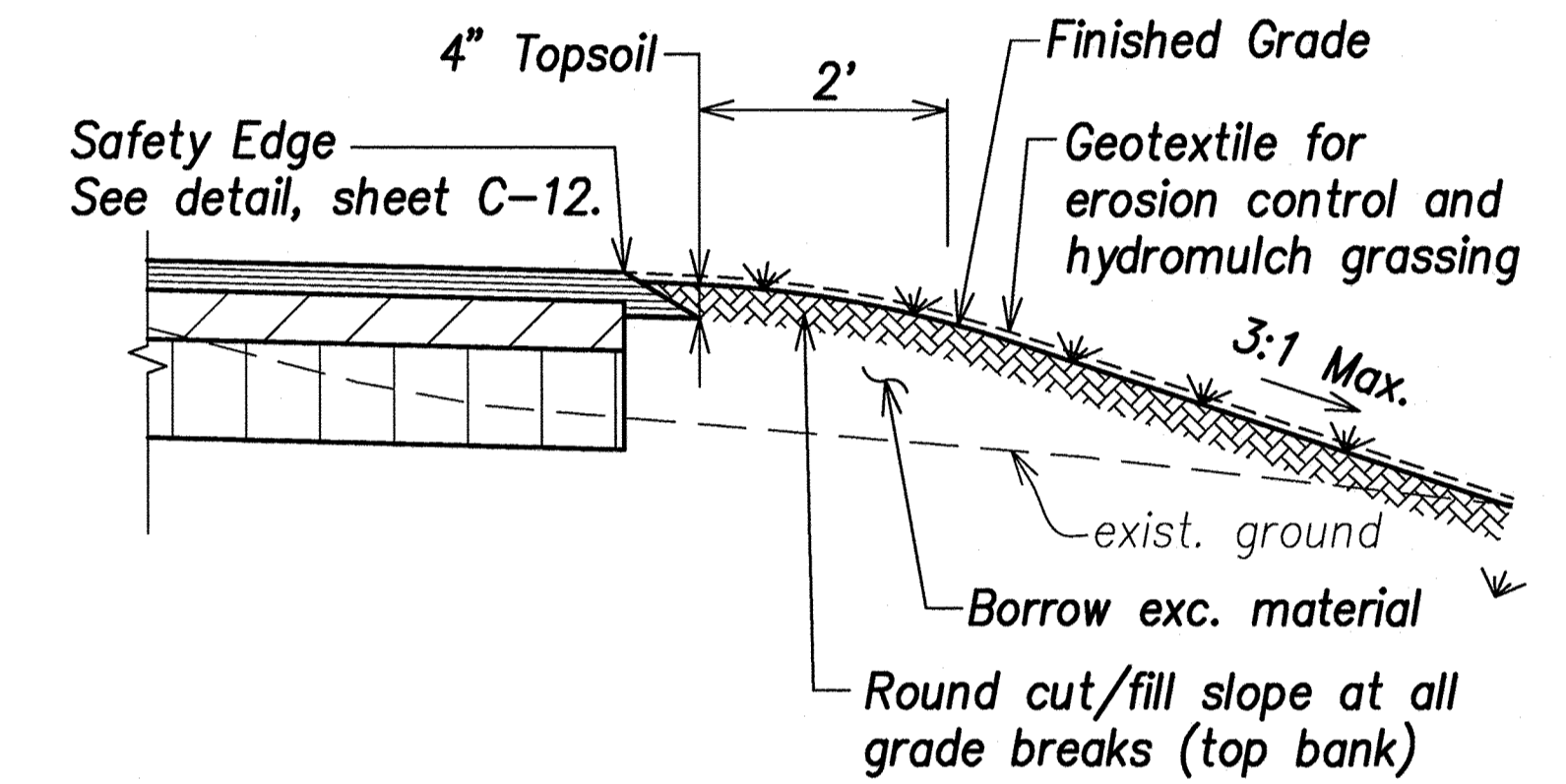
GEOTEXTILE FOR EROSION CONTROL
Not to Scale



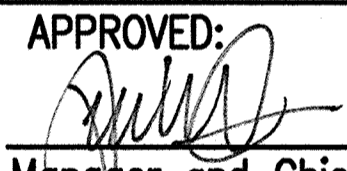
TYPICAL SECTION - Temporary 12" waterline (Kam. Hwy Sta. 1246+96 - 1247+50)
Scale: 1"=5'



TYPICAL SECTION - Temporary 12" waterline on Pedestrian walkway
Scale: 1"=5'

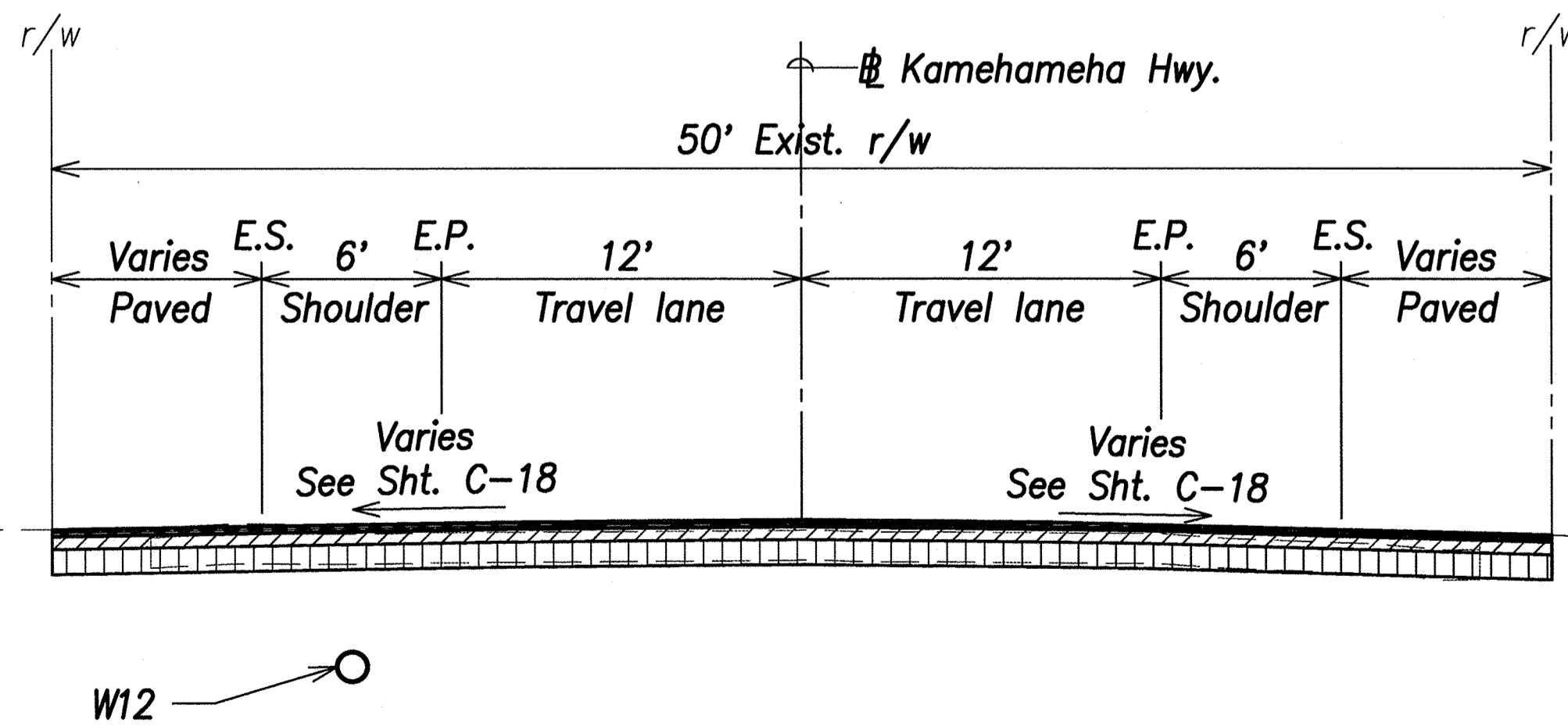


TYPICAL TOP BANK ROUNDING
Not to Scale

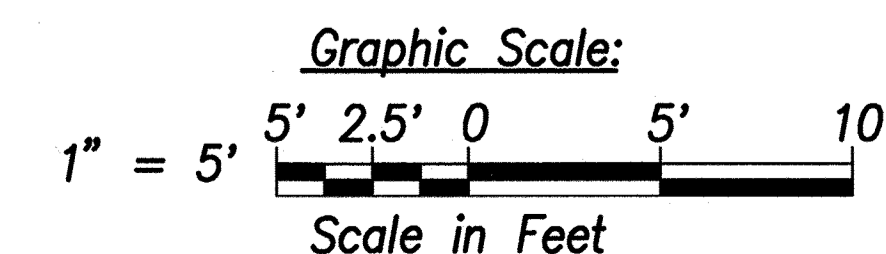
APPROVED:  MAY 24 2021
DATE
Manager and Chief Engineer, BWS (for work affecting BWS facilities State R/W & BWS easements only)

Notes:

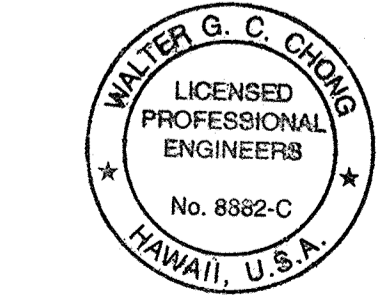
- The Contractor shall photo document the existing landscaping in all adjacent residential lots affected by the project and submit to the engineer. Upon completion of major work items, the Contractor shall restore landscaping back to existing condition or better.
- Hydromulch Grassing. The Contractor shall broadcast sprigs of seashore paspalum at 10 bushels per 1,000 SF capped with hydromulch at 30 lbs per 1,000 SF.
- The Contractor shall secure temporary waterline as required to prevent movement of waterline. All costs related to securing of water line shall be considered incidental to Temporary Water Systems.
- Contractor shall be responsible for protecting & maintaining temporary waterline. Any repairs needed shall be coordinated with BWS personnel. Contractor shall submit shop drawings. All work shall be considered incidental to the various items of work.



TYPICAL SECTION - Temporary 12" waterline (Kam. Hwy Sta. 1248+40 - 1249+15)
Scale: 1"=5'



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| DESIGNED BY | DATE |
| DRAWN BY | |
| CHECKED BY | |
| IN CHARGE | |
| NO. OF SHEETS | |
| DATE | |



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. OBSERVATION OF CONSTRUCTION IS DEFINED IN CHAPTER 16-115, HAWAII ADMINISTRATIVE RULES, ENTITLED PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS.

WALTER G. C. GIORGI
SIGNATURE
R. M. TOWLE CORPORATION
LIC. EXPIRATION 4/30/22

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DIVERSION ROAD

TYPICAL SECTIONS - 1

Kamehameha Highway

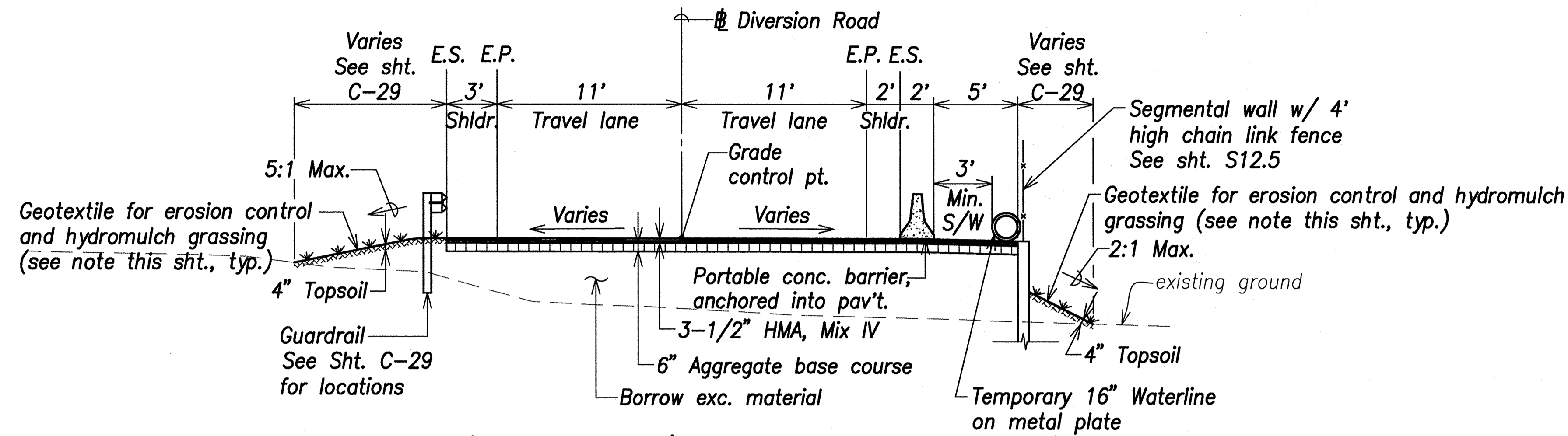
Kaipapau Stream Bridge Replacement

Federal Aid Project No. BR-083-1(48)

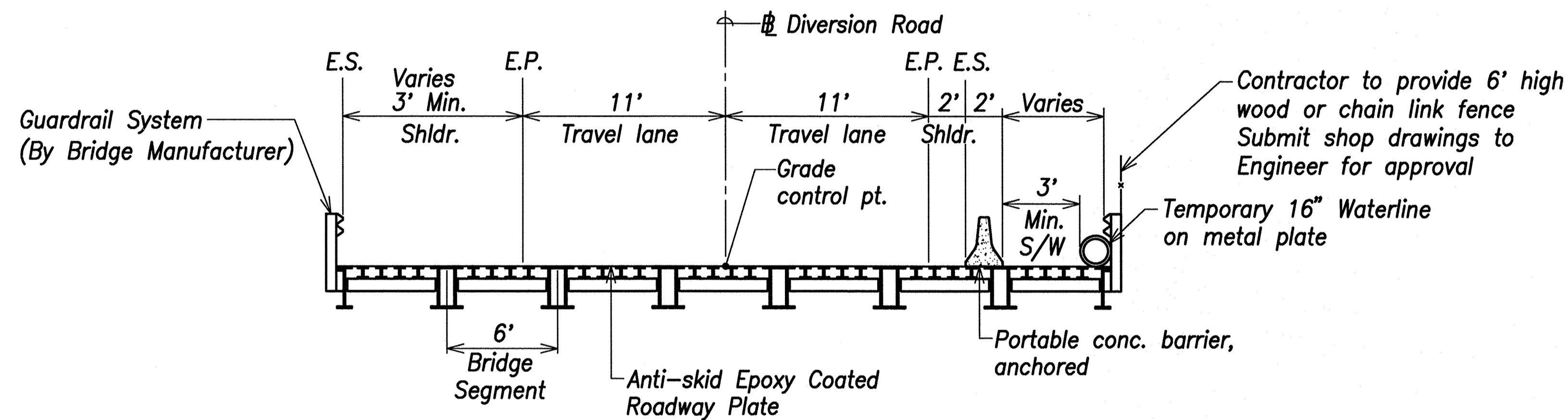
Scale: As Noted Date: February 2021

SHEET No. C-25 OF SHEETS

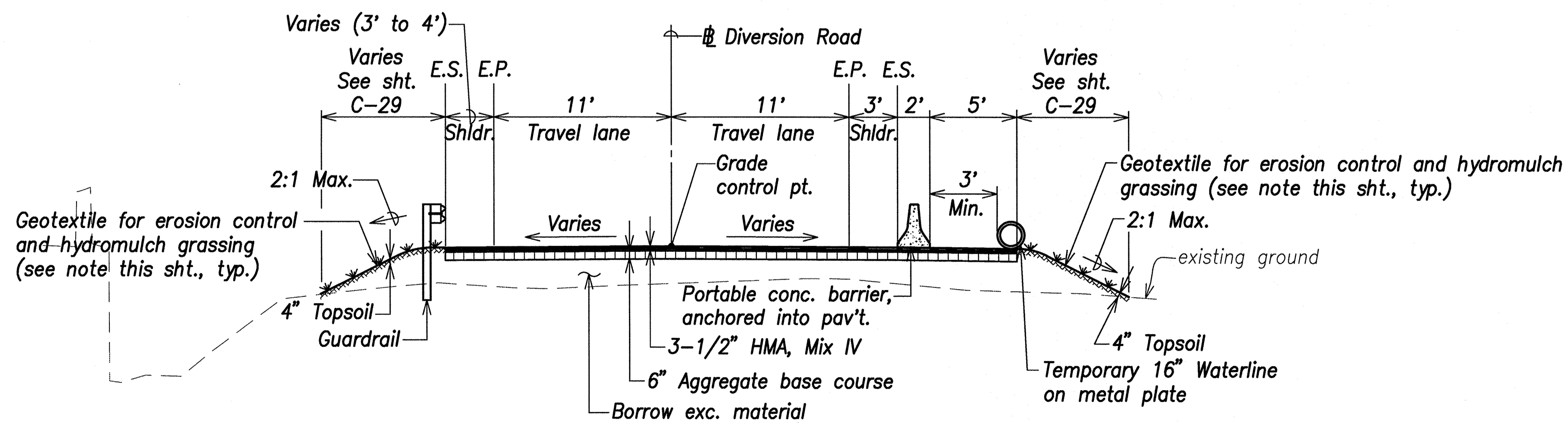
| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 28 | 161 |



TYPICAL SECTION - (Diversion Rd. Sta. 0+60 to Temporary Bridge Abutment-Kaneohe)
Scale: 1"=5'




TYPICAL SECTION - (Diversion Rd. Temporary Bridge)
Scale: 1"=5'

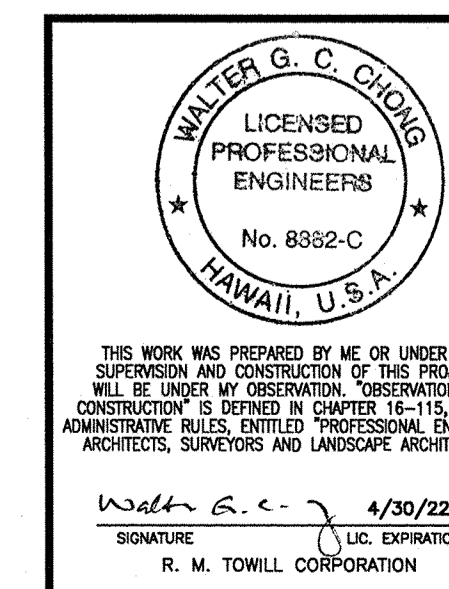


TYPICAL SECTION - (Temporary Bridge Abutment-Kahuku to Diversion Rd. Sta. 2+66.27)
Scale: 1"=5'

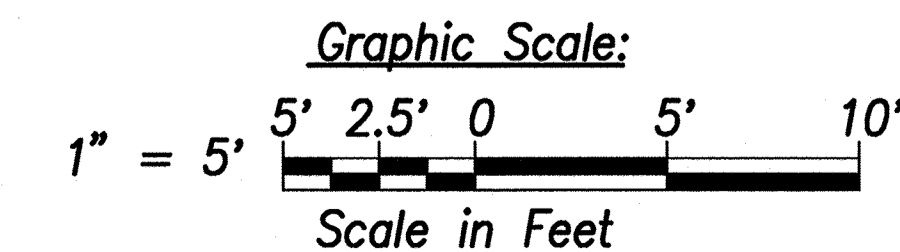
Notes:

1. The Contractor shall photo document the existing landscaping in all adjacent residential lots affected by the project and submit to the engineer. Upon completion of major work items, the Contractor shall restore landscaping back to existing condition or better.
2. Hydromulch Grassing. The Contractor shall broadcast sprigs of seashore paspalum at 10 bushels per 1,000 SF capped with hydromulch at 30 lbs per 1,000 SF.
3. The Contractor shall secure temporary waterline as required to prevent movement of waterline. All costs related to securing of water line shall be considered incidental to Temporary Water Systems.
4. Contractor shall be responsible for protecting & maintaining temporary waterline. Any repairs needed shall be coordinated with BWS personnel. Contractor shall submit shop drawings. All work shall be considered incidental to the various items of work.

APPROVED:  MAY 24 2021
DATE
Manger and Chief Engineer, BWS (for work affecting BWS facilities State R/W & BWS easements only)

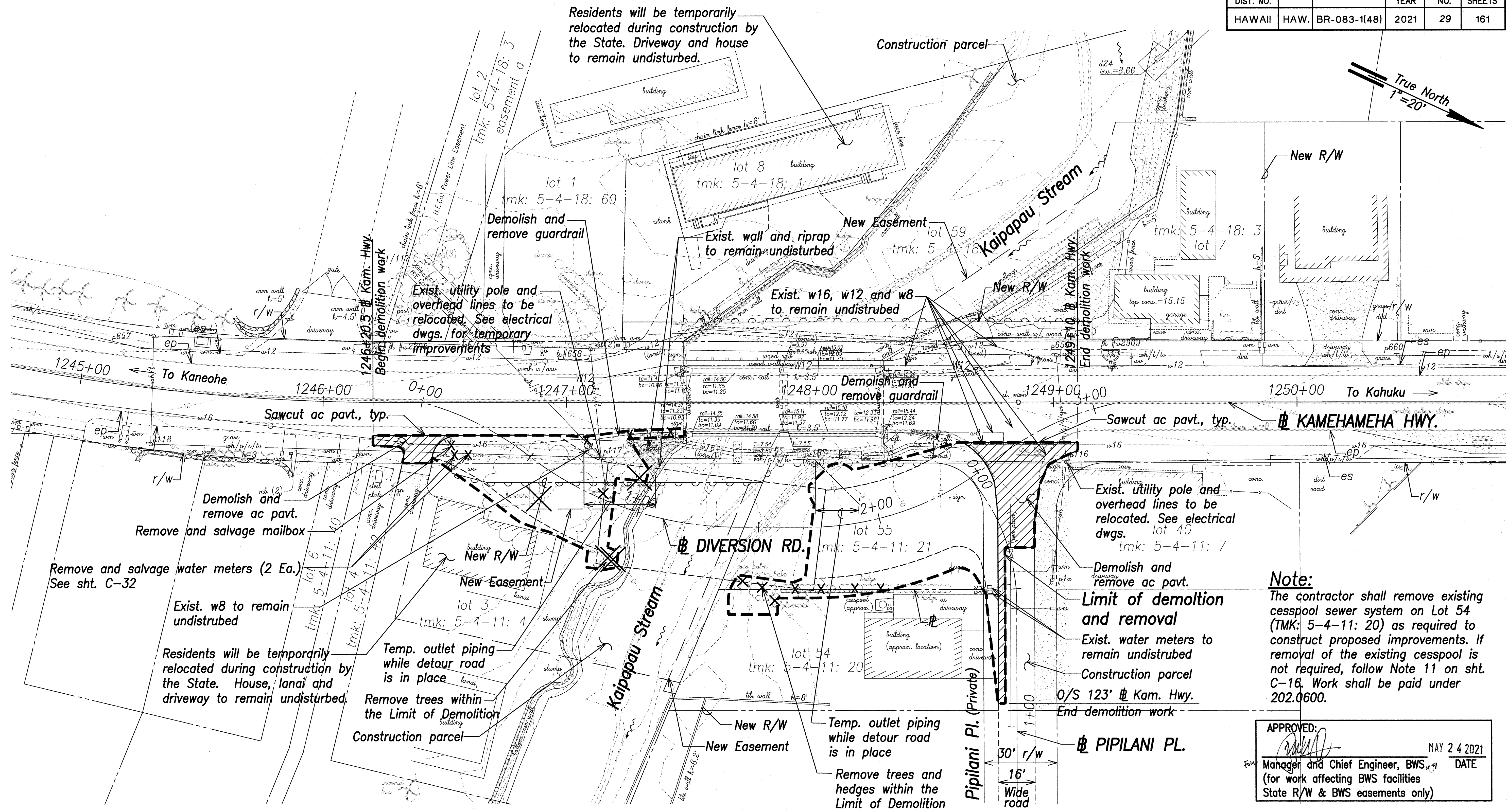


STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DIVERSION ROAD
TYPICAL SECTIONS - 2
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)
Scale: As Noted Date: February 2021

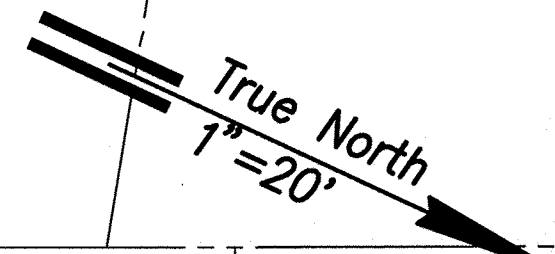


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|---------------|----|----|
| DATE | BY | EC |
| DESIGNED BY | QC | |
| QUANTITIES BY | | |
| CHECKED BY | | |
| GENERAL PLAN | | |
| NOTE BOOK | | |
| No. | | |

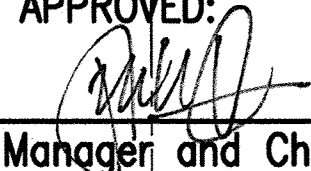
| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 29 | 161 |



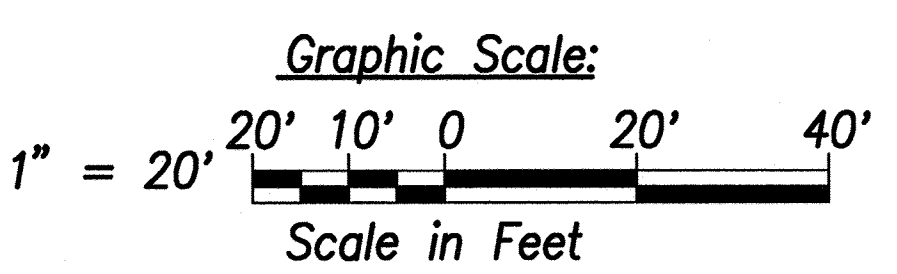
Residents will be temporarily relocated during construction by the State. Driveway and house to remain undisturbed.



Note:
The contractor shall remove existing cesspool sewer system on Lot 54 (TMK: 5-4-11: 20) as required to construct proposed improvements. If removal of the existing cesspool is not required, follow Note 11 on sht. C-16. Work shall be paid under 202.0600.

APPROVED:  MAY 24 2021
DATE
Manager and Chief Engineer, BWS (for work affecting BWS facilities State R/W & BWS easements only)

DIVERSION ROAD - EXISTING CONDITION & DEMOLITION PLAN
Scale: 1"=20'



WALTER G. C. CHONG
LICENSED PROFESSIONAL ENGINEERS
No. 8882-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. 'OPERATION OF CONSTRUCTION' IS DEFINED IN CHAPTER 16-115, HAWAII ADMINISTRATIVE RULES, ENTITLED 'PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS'.

W.G.C. 4/30/22
SIGNATURE: R. M. TOWILL CORPORATION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

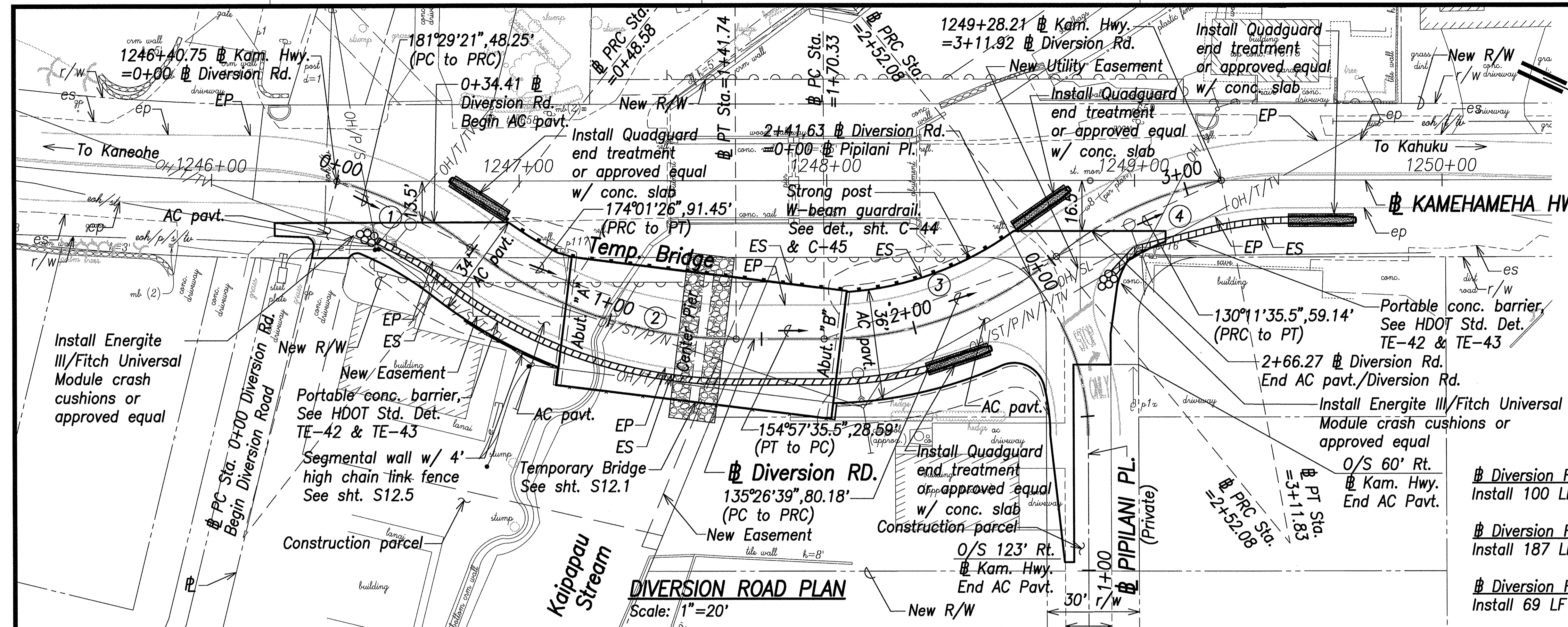
DIVERSION RD. - EXISTING CONDITION & DEMOLITION PLAN

Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

Scale: As Noted Date: February 2021

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| DESIGNED BY | DATE |
| TRACED BY | |
| DESIGNED BY | |
| QUANTITIES BY | |
| CHECKED BY | |
| NO. BOOK | |
| NO. | |

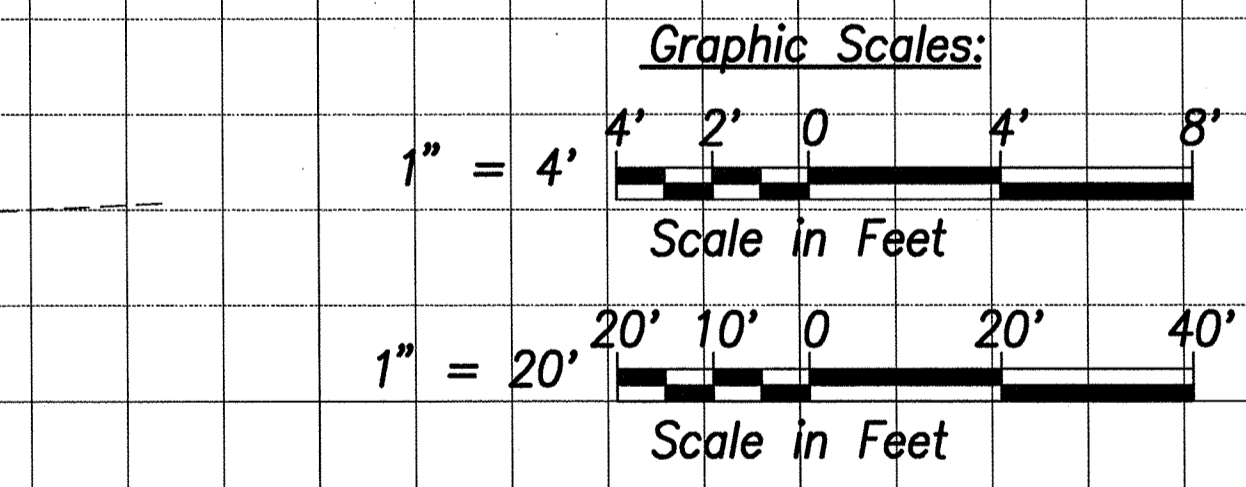
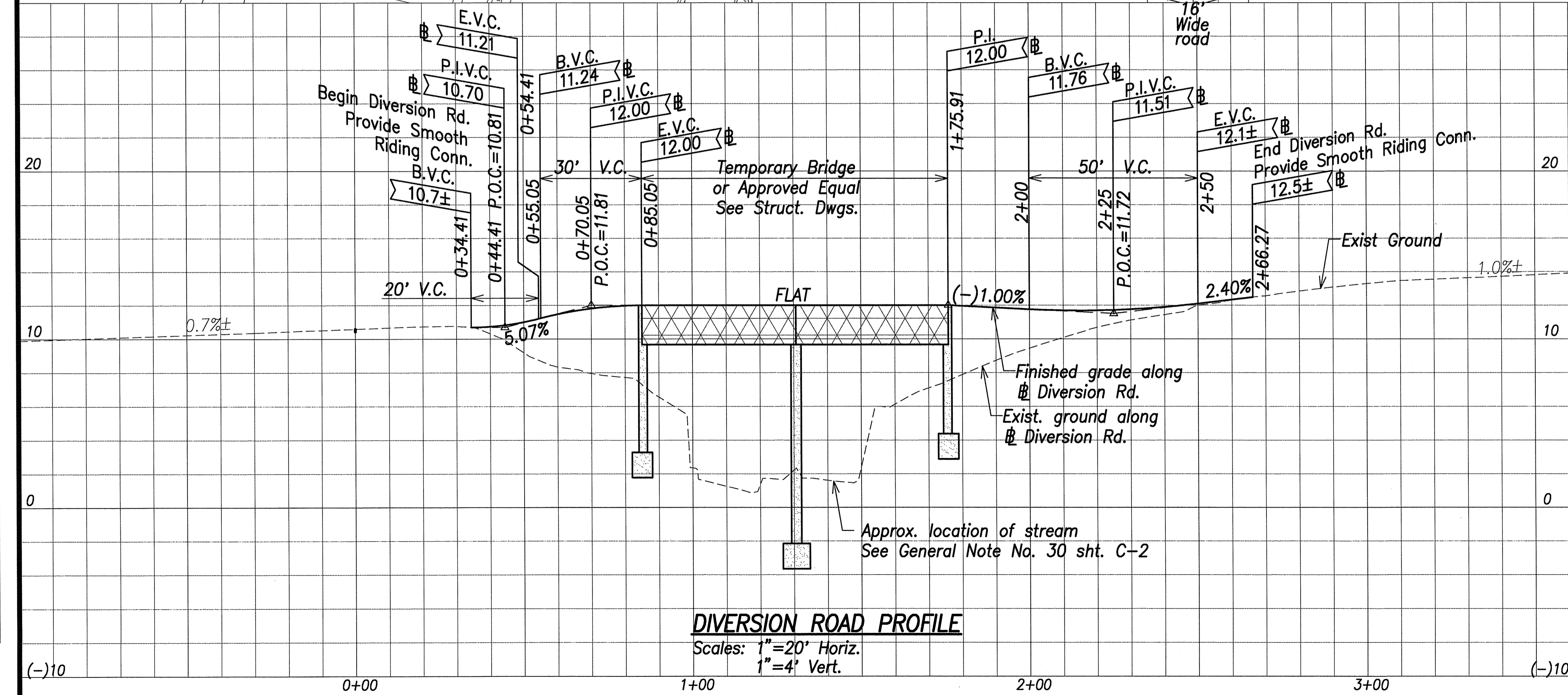
| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 30 | 161 |



Diversion Rd. Curve Data

| Curve No. | Δ | Δ/2 | R | T | C | Lc |
|-----------|-----------|-------------|---------|--------|--------|--------|
| 1 | 23°11'51" | 11°35'55.5" | 120.00' | 24.63' | 48.25' | 48.58' |
| 2 | 38°07'41" | 19°03'50.5" | 140.00' | 48.38' | 91.45' | 93.16' |
| 3 | 39°01'53" | 19°30'56.5" | 120.00' | 42.53' | 80.18' | 81.75' |
| 4 | 28°31'46" | 14°15'53" | 120.00' | 30.51' | 59.14' | 59.75' |

- Notes:**
- The contractor shall adjust the tops of all existing boxes and structures as required to construct the Diversion Road. Adjustment of boxes and structures shall be considered incidental to the various items of work.
 - Portable concrete barriers shall be anchored to protect the temporary waterline. Contractor to provide shop drawings for anchoring the portable concrete barriers on the temporary bridge.
- Additional Notes:**
- Diversion Rd. Sta. 0+53 to Diversion Rd. Sta. 2+53: Install 100 LF strong post W-Beam guardrail on Mauka side.
 - Diversion Rd. Sta. 0+21 to Diversion Rd. Sta. 2+08: Install 187 LF Portable conc. barrier on Makai side.
 - Diversion Rd. Sta. 2+65 to Diversion Rd. Sta. 3+34: Install 69 LF Portable conc. barrier Makai side.



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| DATE | BY |
| DESIGNED BY | WC |
| CHECKED BY | |
| APPROVED BY | |
| NO. OF SHEETS | |
| TOTAL SHEETS | |

WALTER G. C. CHONG
LICENSED PROFESSIONAL ENGINEER
No. 8882-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. OBSERVATION OF CONSTRUCTION IS DEFINED IN CHAPTER 16-115, HAWAII ADMINISTRATIVE RULES, ENTITLED "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS."

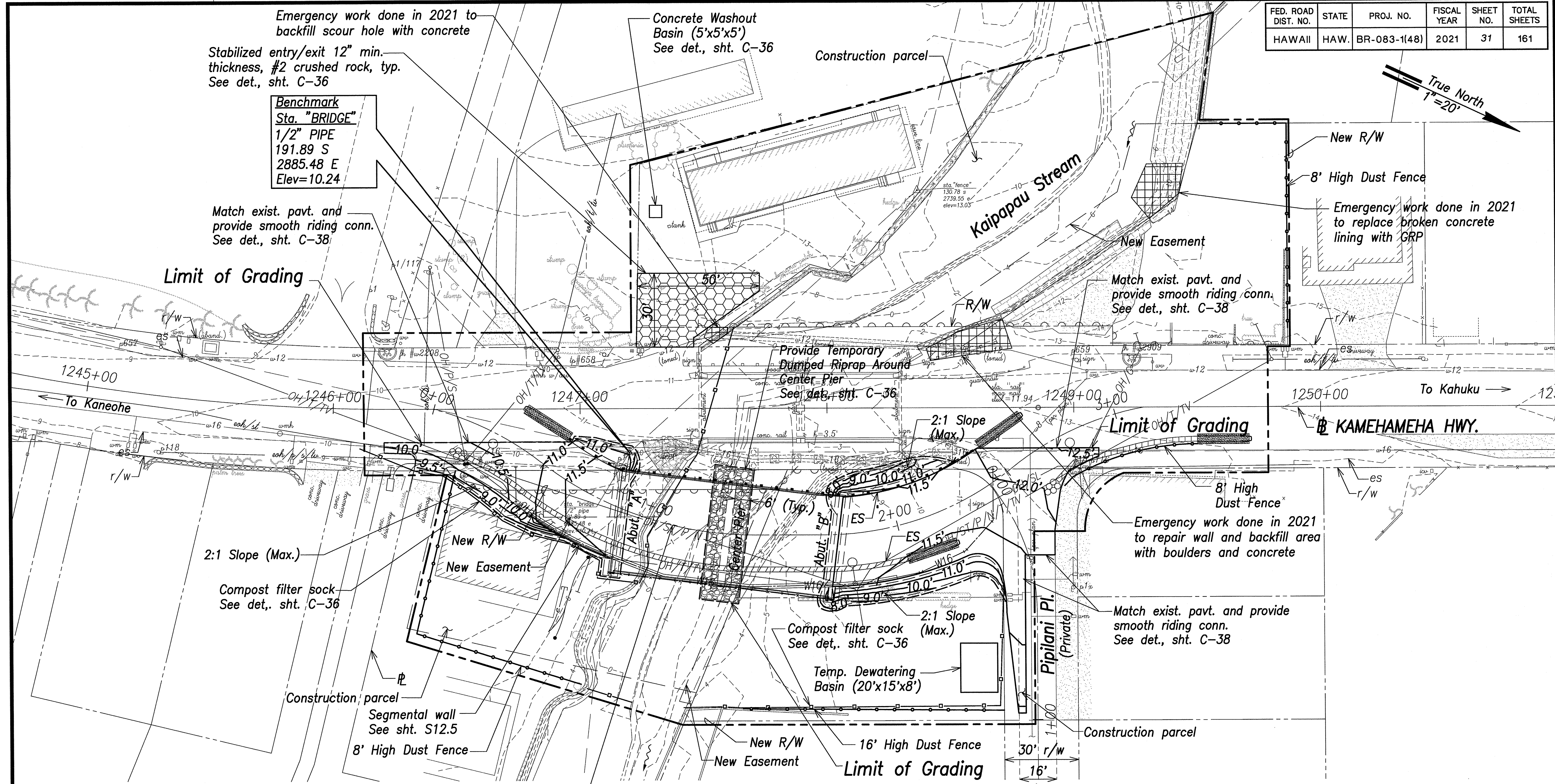
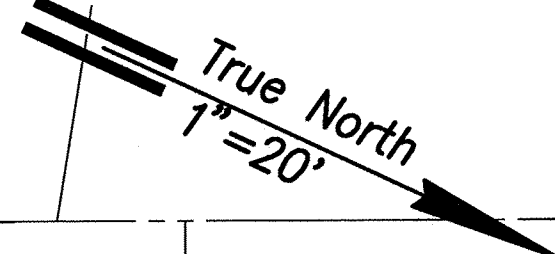
Walter G. C. Chong 1/30/22
R. M. TOWILL CORPORATION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DIVERSION ROAD
PLAN & PROFILE
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. C-28 OF SHEETS

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 31 | 161 |



Benchmark
Sta. "BRIDGE"
1/2" PIPE
191.89 S
2885.48 E
Elev=10.24

Emergency work done in 2021 to backfill scour hole with concrete
Stabilized entry/exit 12" min. thickness, #2 crushed rock, typ. See det., sht. C-36

Concrete Washout Basin (5'x5'x5')
See det., sht. C-36

Match exist. pavt. and provide smooth riding conn. See det., sht. C-38

Limit of Grading

Provide Temporary Dumped Riprap Around Center Pier
See det., sht. C-36

Match exist. pavt. and provide smooth riding conn. See det., sht. C-38

Emergency work done in 2021 to replace broken concrete lining with GRP

Limit of Grading

8' High Dust Fence

Emergency work done in 2021 to repair wall and backfill area with boulders and concrete

Match exist. pavt. and provide smooth riding conn. See det., sht. C-38

2:1 Slope (Max.)

Compost filter sock
See det., sht. C-36

Compost filter sock
See det., sht. C-36

Temp. Dewatering Basin (20'x15'x8')

16' High Dust Fence

Limit of Grading

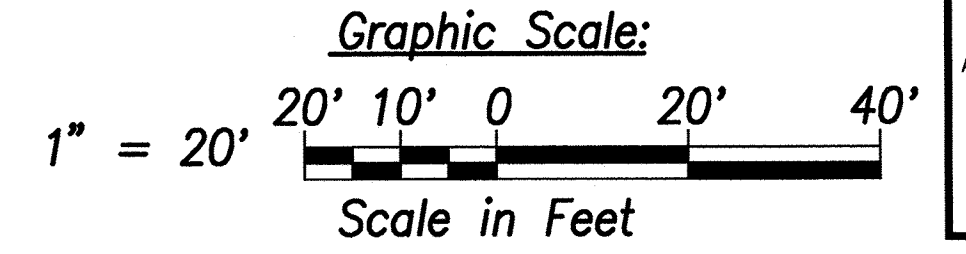
Legend:

- Project Limits
- 10' Exist. Ground Contour
- 10.0' Finished Grade Contour
- Limit of Grading
- Dust Fence
- Compost Filter Sock
- Drainage Flow Direction
- Stabilized Entry/Exit

DIVERSION ROAD - GRADING, EROSION AND SEDIMENT CONTROL PLAN
Scale: 1"=20'

Notes:

- The contractor shall be responsible for obtaining grading permit from the City and County of Honolulu, Department of Planning and Permitting.
- Sediment and Erosion Control BMP measures shown in the Contract Documents are minimum BMPs requirements and do not constitute an acceptable and/or complete Sediment and Erosion Control Plan. The Contractor shall incorporate additional BMPs based upon their means and methods considering site conditions and construction sequence in accordance with the Contract Documents including applicable permit document requirements. Cost shall be included in Pay Item 209.0100, "Installation, Maintenance, Monitoring, and Removal of BMP."



WALTER G. C. CHOI'S
LICENSED PROFESSIONAL ENGINEERS
No. 8802-C
HAWAII, U.S.A.

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Walter G. C. Choi
4/30/22
SIGNATURE LIC. EXPIRATION
R. M. TOWILL CORPORATION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DIVERSION ROAD-GRADING, EROSION AND SEDIMENT CONTROL PLAN
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

Scale: As Noted Date: February 2021
SHEET No. C-29 OF SHEETS

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| DESIGNED BY | DATE |
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| QUANTITIES BY | |
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| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 33 | 161 |

Suggested Phasing for Work on 16" Waterline:

PHASE 1:
Existing w16 and w8 serving Pipilani Road shall remain in service at all times. Construct detour road and temporary bridge. Construct Phase 1 waterline improvements shown on this sheet and perform pressure test and chlorination (See note 1).

PHASE 2:
Contractor shall coordinate with BWS personnel for the shutdown of the 16" waterline in the Kaneohe and Kahuku direction. The Contractor shall be responsible for providing advanced notification to all users affected by the waterline shutdown. Drain w16 using existing w8 blowoff line. Construct Phase 2 waterline improvements shown on this sheet. (Note: Maximum allowable time for w16 and w8 shutdown is 8 hours)

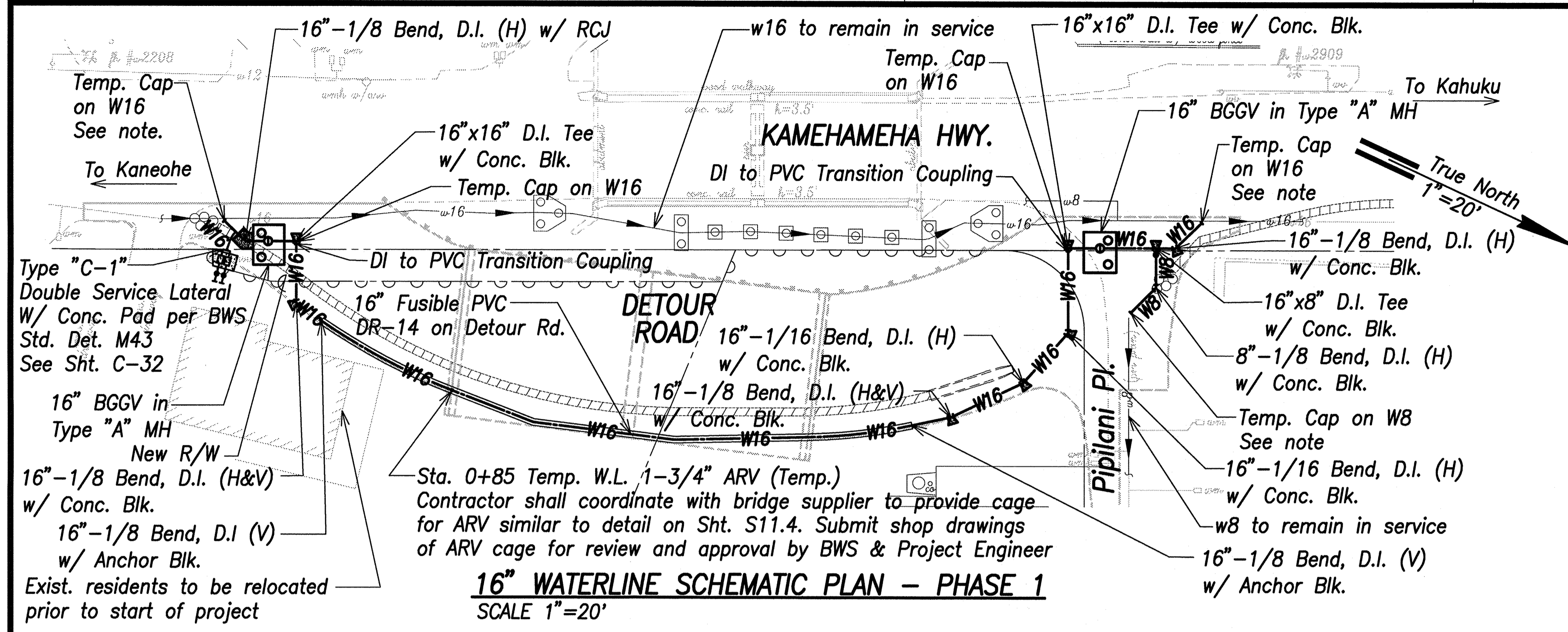
After temporary W16 waterline is in service, demolish and remove the existing w16 and existing foundation system shown in Phase 2 on this sheet. Backfill to the abandoned waterline. Abandon-in-place the existing w16 and existing foundation system under Kaipapau Stream. The contractor shall plug both ends of abandoned waterline and fill with flowable grout or CLSM.

PHASE 3:
Construct new bridge and Phase 3 waterline improvements, including W8 blowoff line and W16 hung on the bridge with pipe supports, as shown on this sheet. See structural drawings for details. Perform pressure test and chlorination. Contractor shall coordinate with BWS personnel for the shutdown of the W16 bypass waterline. The Contractor shall be responsible for providing advanced notification to all users affected by the waterline shutdown. (Note: Maximum allowable down time for W16 is 8 hours) Connect W16 on both sides of new bridge.

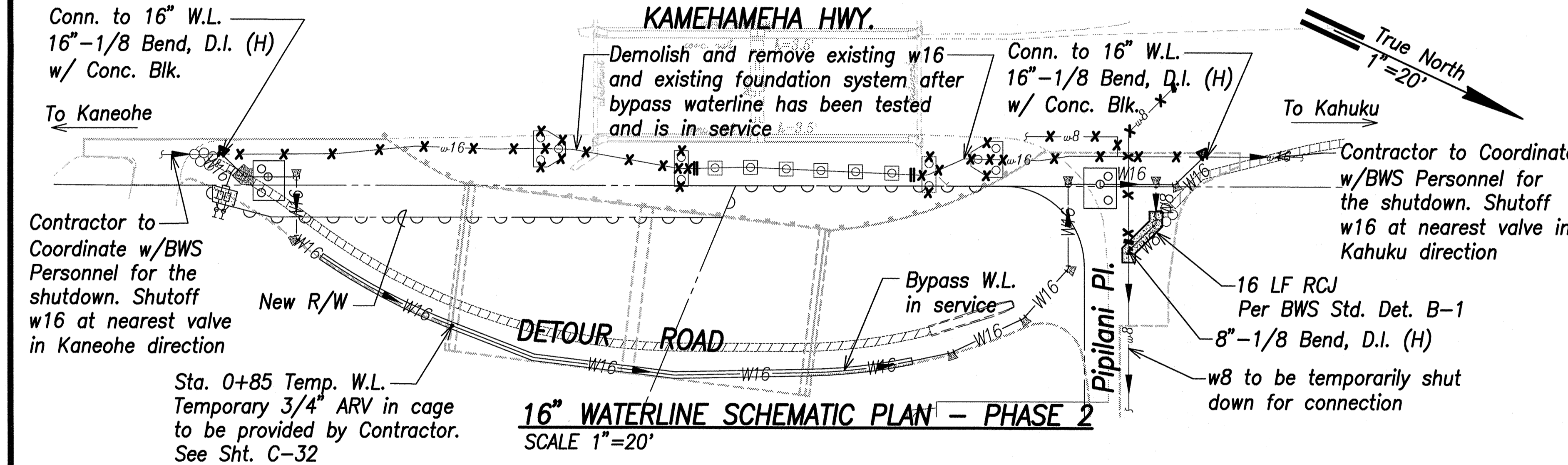
After W16 waterline is in service, demolish and remove the bypass waterline.

Notes:

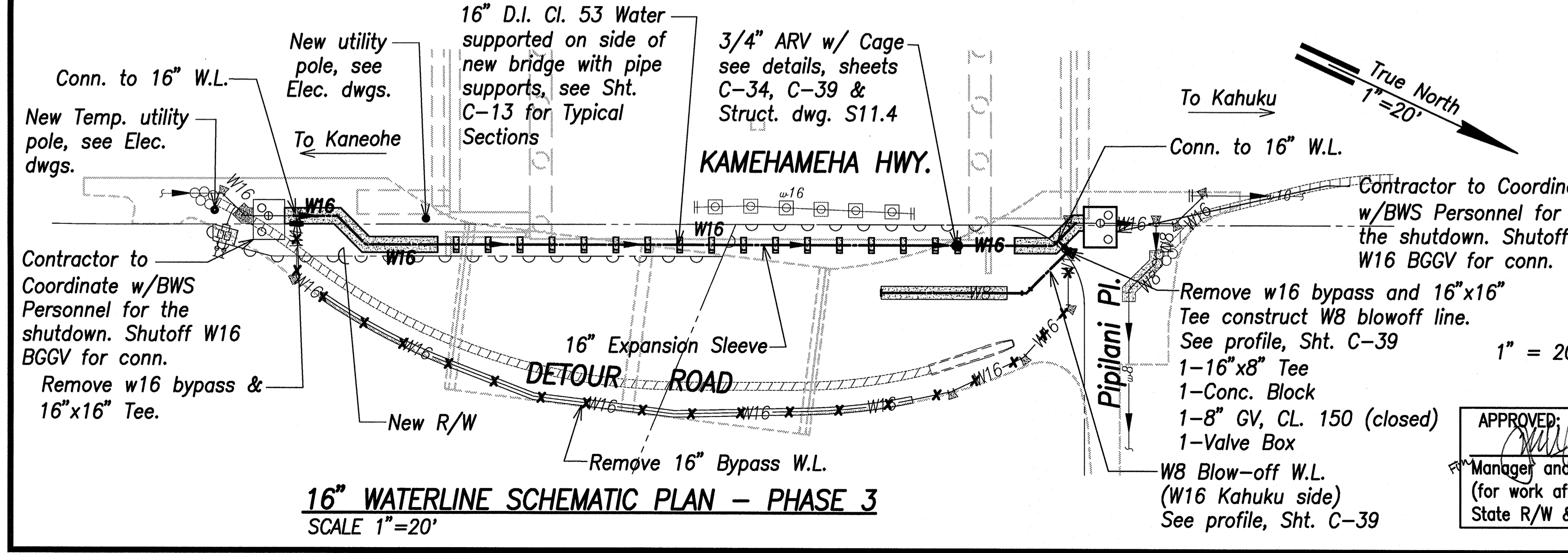
1. Connection of the temporary 16" waterline to the existing 16" waterline cannot begin until after the permanent 12" waterline has been pressure tested, accepted by BWS and placed into service and the temporary 12" waterline has been removed. The contractor shall verify the invert and location of the existing 16-inch waterline prior to the start of waterline construction and adjust the invert of the new 16-inch waterline to match the existing invert for future connection.
2. The contractor shall be responsible for anchoring the portion of fusible PVC waterline that will be located above ground. Contractor shall be responsible for protecting and maintaining temporary waterline for the entire time it is in service (estimated to be 20 months). Contractor shall submit shop drawings of temporary w16 waterline restraints before starting construction. All work shall be considered incidental to the various items of work.
3. Exposed ductile iron waterline and ductile iron fittings shall be coated with an approved bitumastic paint.
4. See Sht. C-26 for sections showing temporary 16" waterline on detour road.



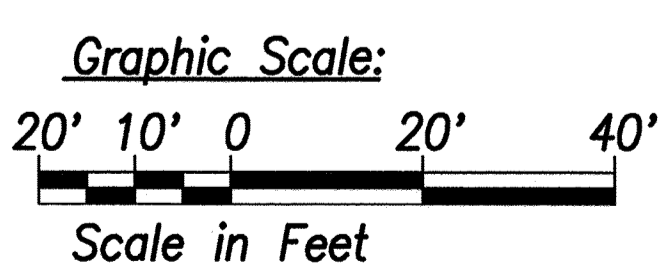
16" WATERLINE SCHEMATIC PLAN - PHASE 1
SCALE 1"=20'



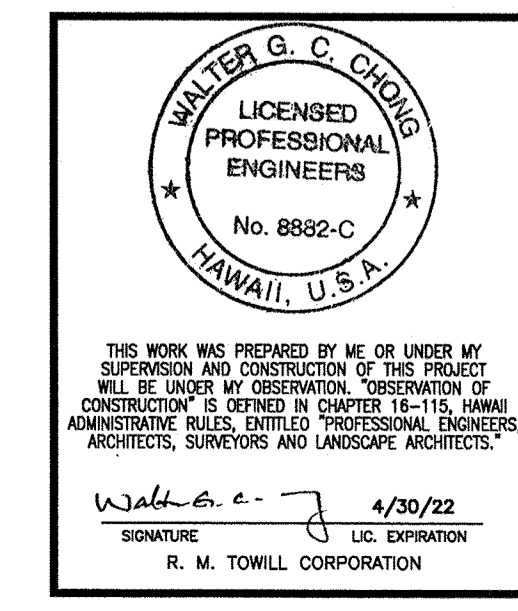
16" WATERLINE SCHEMATIC PLAN - PHASE 2
SCALE 1"=20'



16" WATERLINE SCHEMATIC PLAN - PHASE 3
SCALE 1"=20'



APPROVED: *[Signature]* MAY 24 2021
DATE
Manager and Chief Engineer, BWS
(for work affecting BWS facilities
State R/W & BWS easements only)



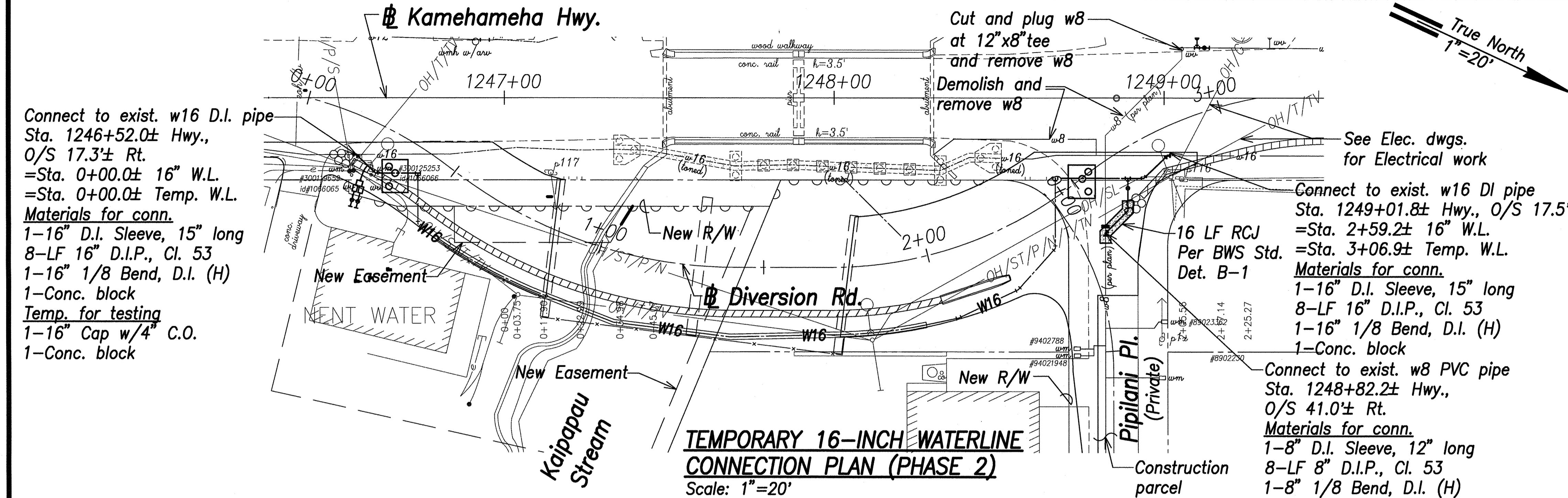
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

16-INCH WATERLINE PHASING PLAN
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

Scale: As Noted Date: February 2021

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| DESIGNED BY | DATE |
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| QUANTITIES BY | |
| NO. BOOK | |
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| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 35 | 161 |



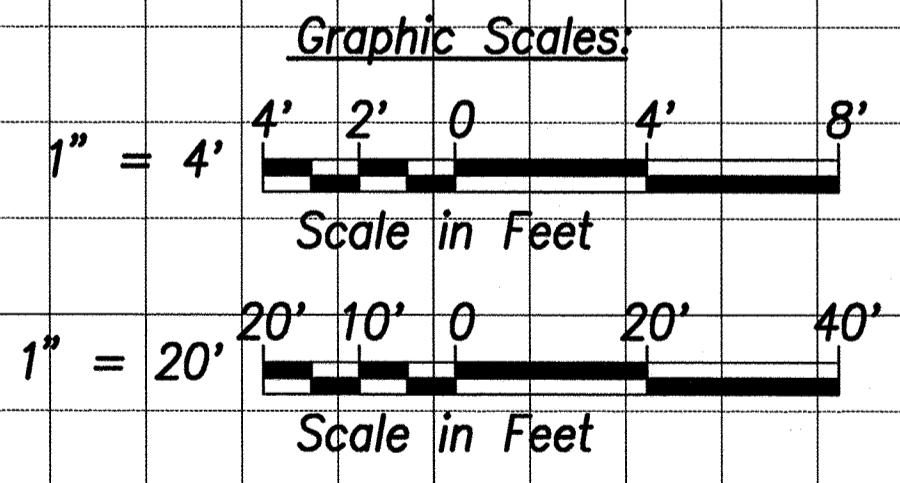
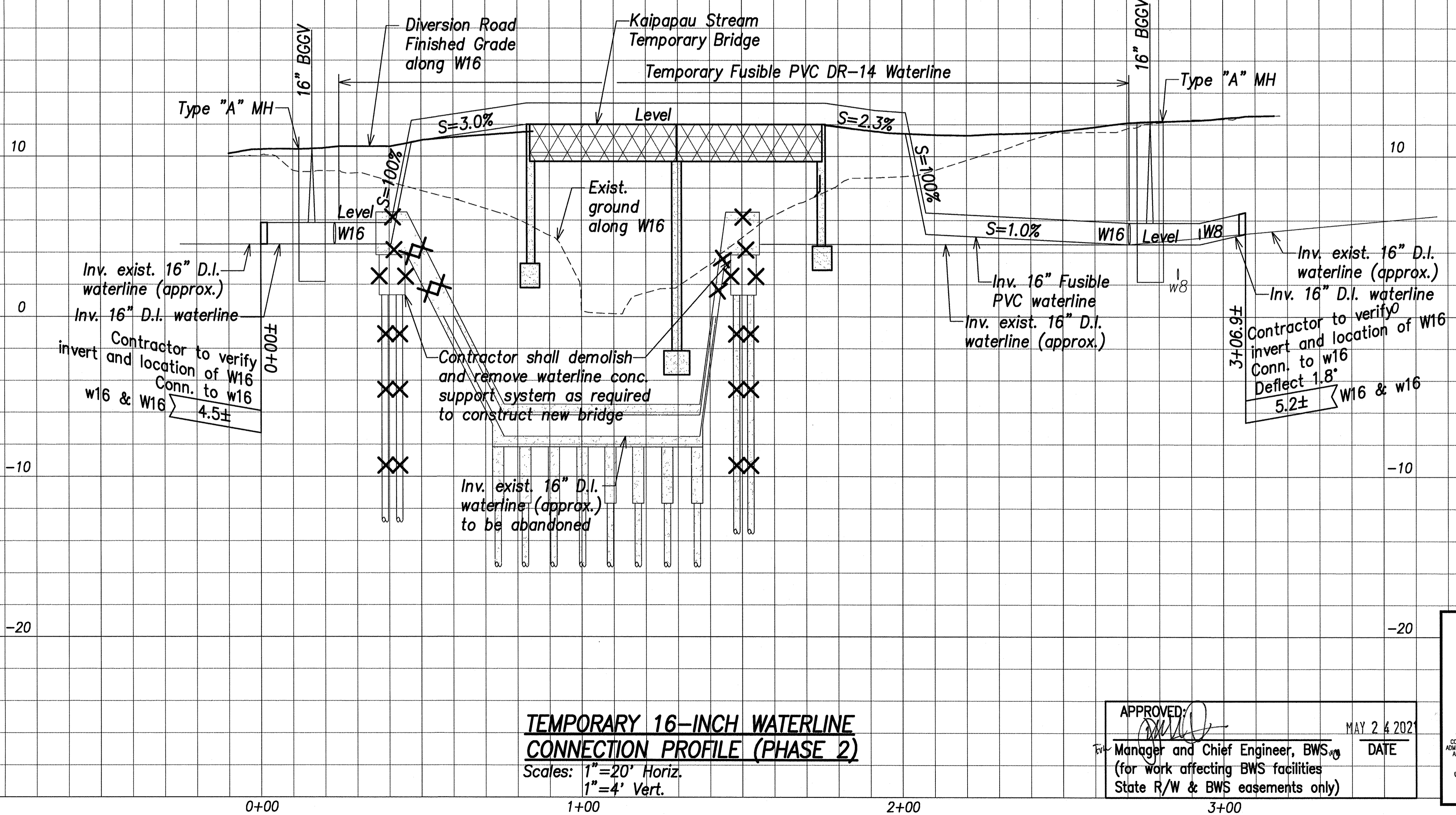
Connect to exist. w16 D.I. pipe
Sta. 1246+52.0± Hwy.,
O/S 17.3± Rt.
=Sta. 0+00.0± 16" W.L.
=Sta. 0+00.0± Temp. W.L.
Materials for conn.
1-16" D.I. Sleeve, 15" long
8-LF 16" D.I.P., Cl. 53
1-16" 1/8 Bend, D.I. (H)
1-Conc. block
Temp. for testing
1-16" Cap w/4" C.O.
1-Conc. block

See Elec. dwgs.
for Electrical work

Connect to exist. w16 DI pipe
Sta. 1249+01.8± Hwy., O/S 17.5± Rt.
=Sta. 2+59.2± 16" W.L.
=Sta. 3+06.9± Temp. W.L.
Materials for conn.
1-16" D.I. Sleeve, 15" long
8-LF 16" D.I.P., Cl. 53
1-16" 1/8 Bend, D.I. (H)
1-Conc. block

Connect to exist. w8 PVC pipe
Sta. 1248+82.2± Hwy.,
O/S 41.0± Rt.
Materials for conn.
1-8" D.I. Sleeve, 12" long
8-LF 8" D.I.P., Cl. 53
1-8" 1/8 Bend, D.I. (H)

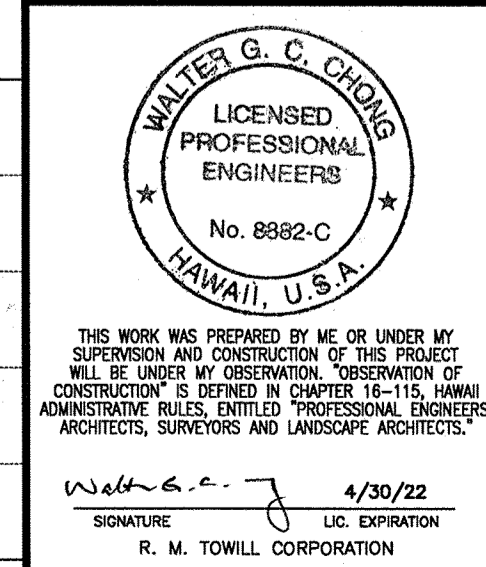
- Notes:**
- The existing waterlines shown on these plans were located using record drawings and toning information from the Board of Water Supply. The contractor shall make an independent check by probing the waterlines and coordinating with the Board of Water Supply to ascertain the exact locations of the waterlines. Any discrepancies shall be immediately brought to the attention of the Project Engineer prior to any work on the water system.
 - Connection of the temporary 16" waterline to the existing 16" waterline cannot begin until after the permanent 12" waterline has been pressure tested, accepted by BWS and placed into service and the temporary 12" waterline has been removed.



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|-------------------|------|
| SURVEY PLOTTED BY | DATE |
| DESIGNED BY | BY |
| DESIGNED BY | TC |
| QUANTITIES BY | |
| CHECKED BY | |
| ORIGINAL PLAN | |
| NOTE BOOK | |
| No. | |

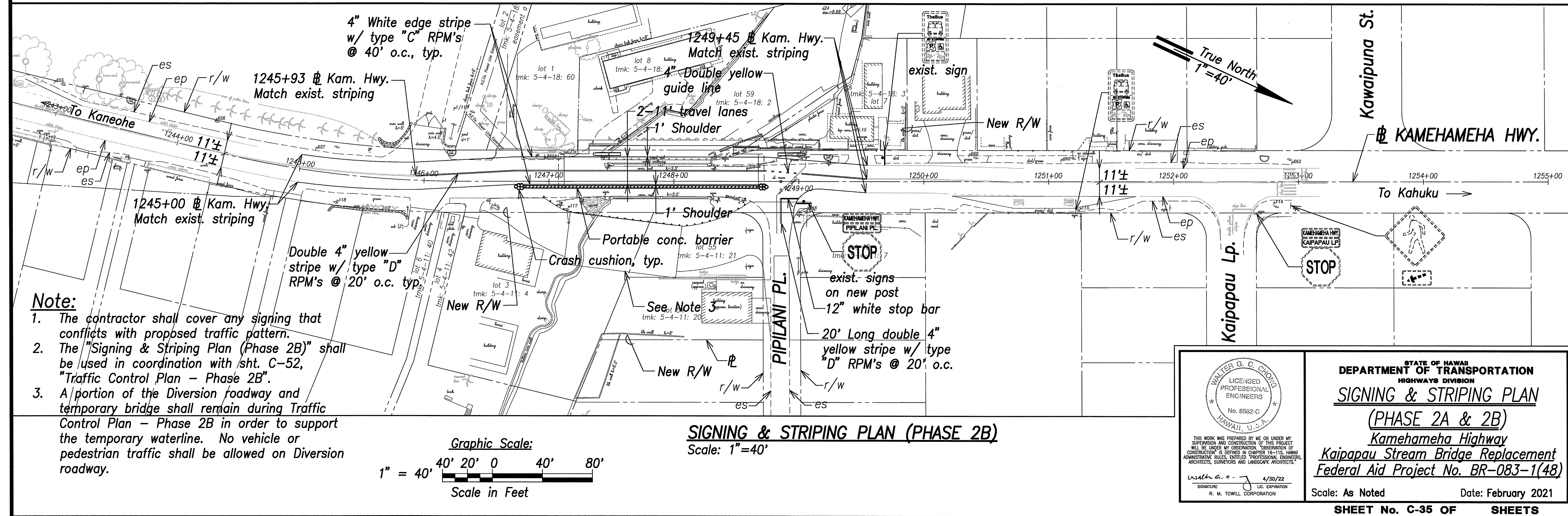
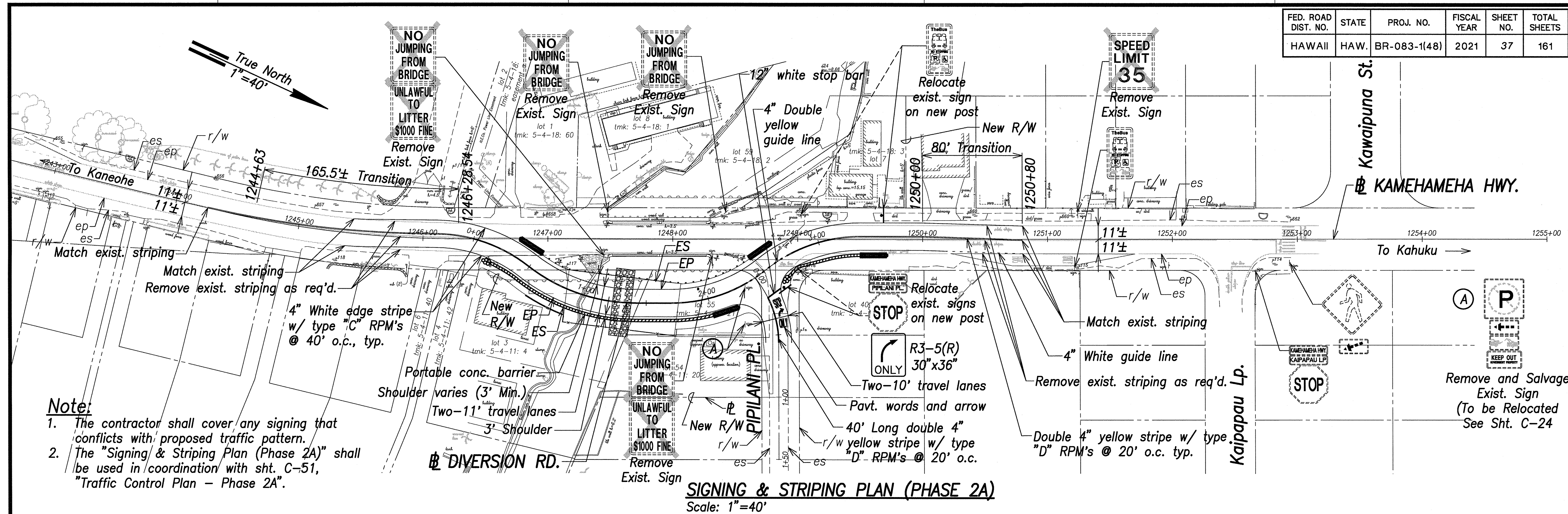
TEMPORARY 16-INCH WATERLINE CONNECTION PROFILE (PHASE 2)
Scales: 1"=20' Horiz.
1"=4' Vert.

APPROVED:
Manager and Chief Engineer, BWS
(for work affecting BWS facilities
State R/W & BWS easements only)
DATE: MAY 24 2021



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
TEMPORARY 16-INCH WATERLINE CONNECTION PLAN (PHASE 2)
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)
Scale: As Noted Date: February 2021

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
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| HAWAII | HAW. | BR-083-1(48) | 2021 | 37 | 161 |



| | |
|-------------|----|
| DATE | BY |
| DESIGNED BY | BY |
| CHECKED BY | BY |
| NO. | |

WALTER G. C. CHOI
LICENSED PROFESSIONAL ENGINEERS
No. 8862-C
HAWAII, U.S.A.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
SIGNING & STRIPING PLAN
(PHASE 2A & 2B)
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

Scale: As Noted **Date: February 2021**

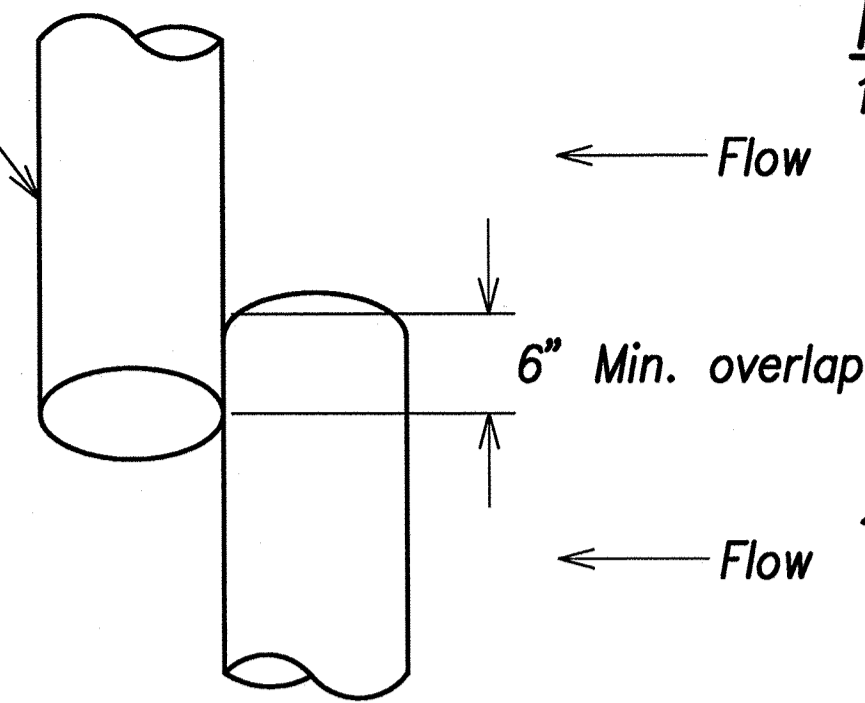
SHEET No. C-35 OF SHEETS

**NATIONAL MARINE FISHERIES SERVICE (NMFS) HABITAT
CONSERVATION DIVISION, BEST MANAGEMENT PRACTICES (BMPs)**

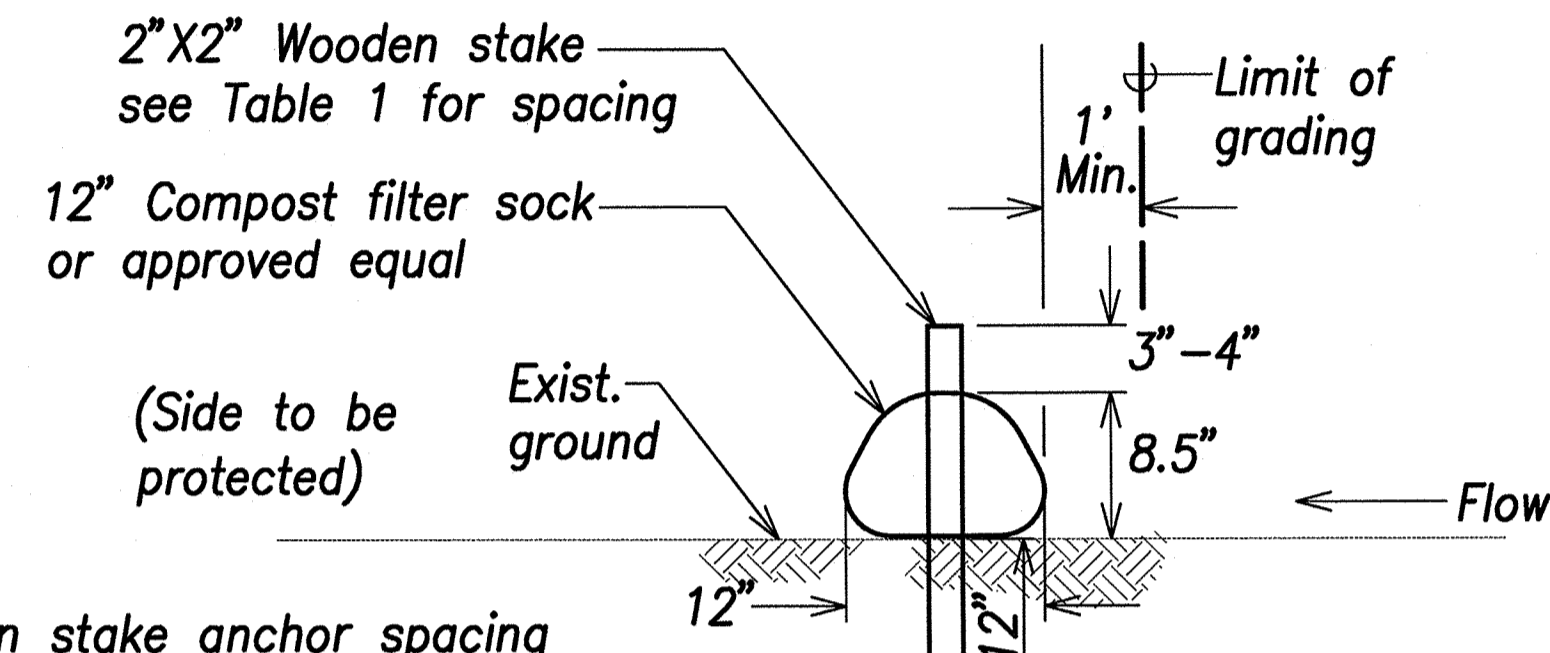
- To control sedimentation, erosion control practices and silt containment devices (i.e. silt fences, basins, etc.) will be used and work will be curtailed during adverse weather and tidal/flow conditions
- In-stream activities will be scheduled during the dry season (May – September) and when fair weather conditions are expected.
- A contingency plan will be developed to control toxic materials.
- Spill prevention and control materials will be stored on-site to clean potential spills.
- All project-related materials and equipment will be free of pollutants.
- Construction equipment will be regularly maintained to minimize the discharge and fluids and chemicals. All heavy equipment operations will be postponed or halted should a leak be detected.
- Fueling of land-based vehicles and equipment will occur at least 50-feet away from the water, preferably over an impervious surface.
- To prevent concrete spill waste, accidentally spilled material will be cleaned up immediately, excess concrete will not be mixed, and concrete will be disposed of in a lidded container.
- Netting material will be suspended under the new bridge structure to catch falling debris.
- Untreated wood, concrete, and steel will be used; pressure-treated lumber will be avoided to prevent introducing invasive species.
- Following construction, all areas disturbed by construction activities will be restored and/or stabilized by landscaping, planting grass, and paving.
- The Contractor shall ensure that natural stream flow rates are maintained during stream diversion activities.
- The Contractor shall monitor the integrity and placement of the sandbags during stream diversion activities. If sandbags begin to tear or move, work should be stopped until they are replaced and/or adjusted.
- Prior to mobilizing, ensure all construction equipment does not pose a risk of introducing new invasive species and will not increase abundance of invasive species at the project location.

12" Compost filter sock or approved equal, install per manufacturer's recommendation

(Side to be protected)



PLAN

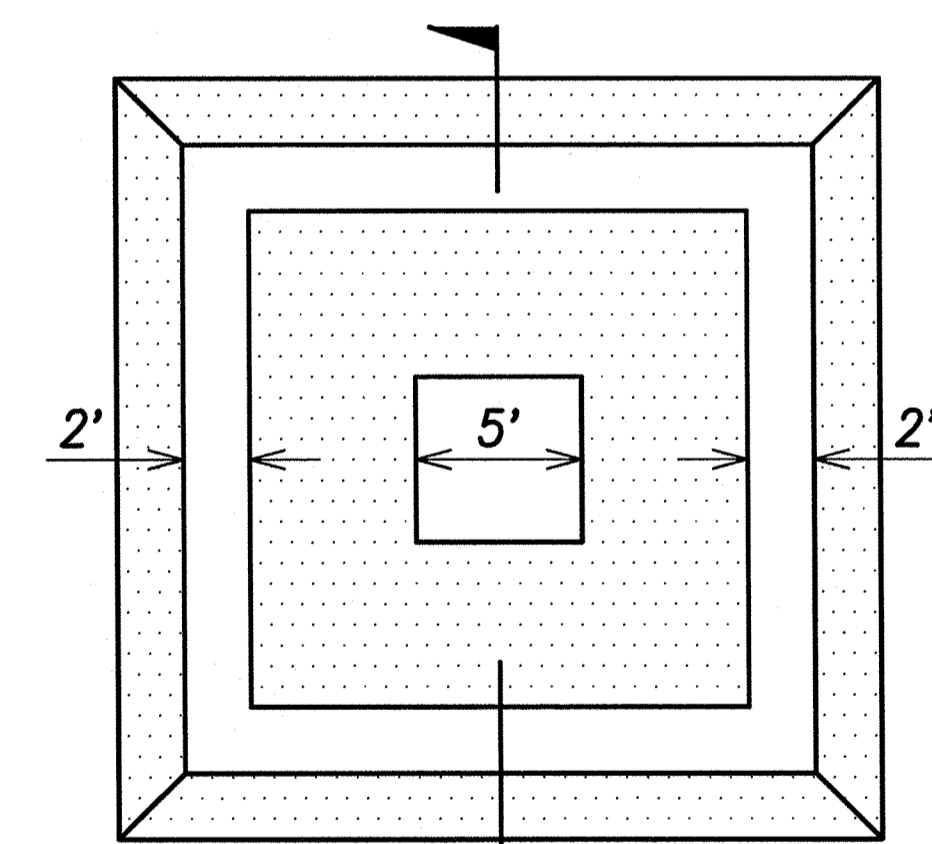


SECTION

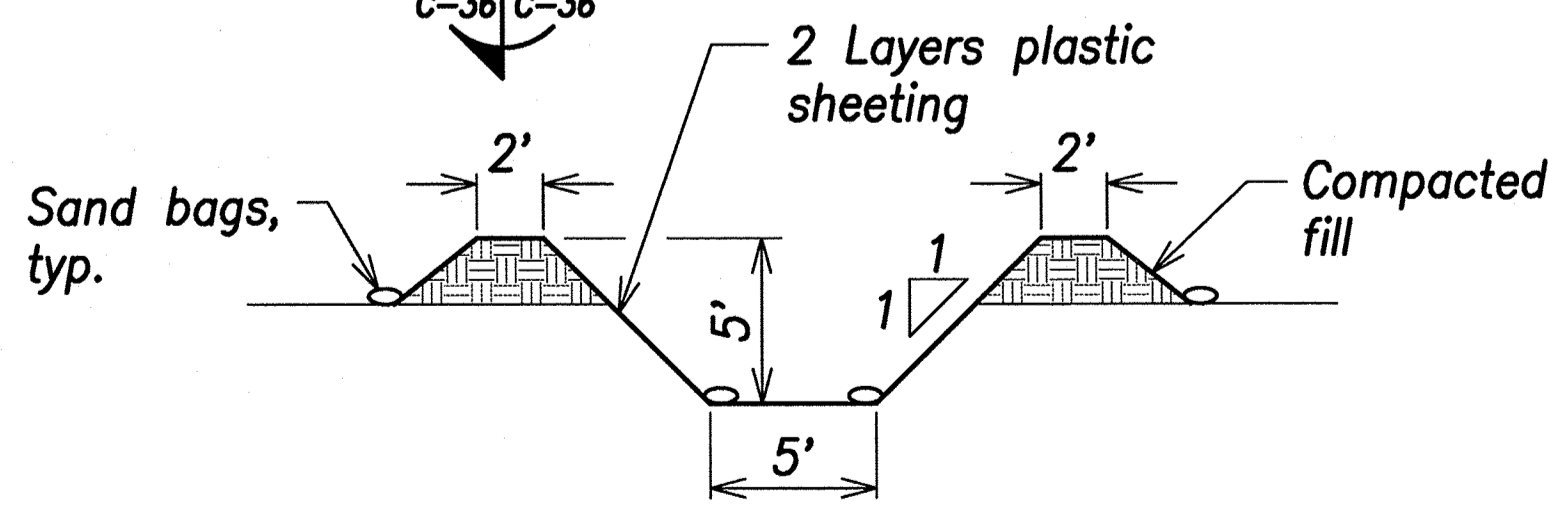
Table 1: Wooden stake anchor spacing

| Slope | Anchor spacing |
|--------------|----------------|
| < 4:1 | Not required |
| 4:1 to 3:1 | 10' O.C. |
| > 3:1 to 2:1 | 5' to 10' O.C. |
| > 2:1 | 5' O.C. |

**COMPOST FILTER SOCK DETAIL
NOT TO SCALE**



PLAN VIEW



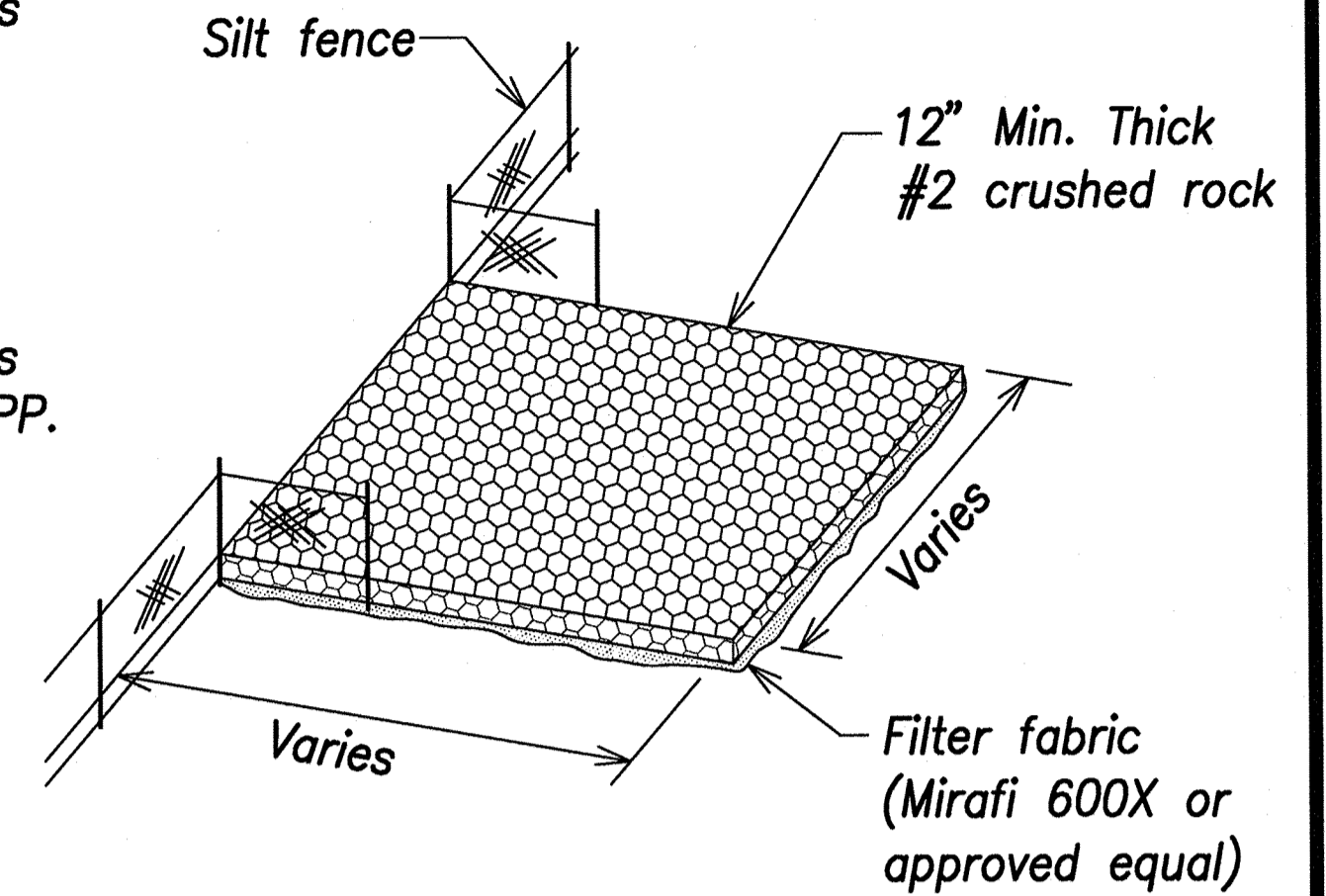
SECTION

**CONCRETE WASH-OUT BASIN DETAIL
NOT TO SCALE**

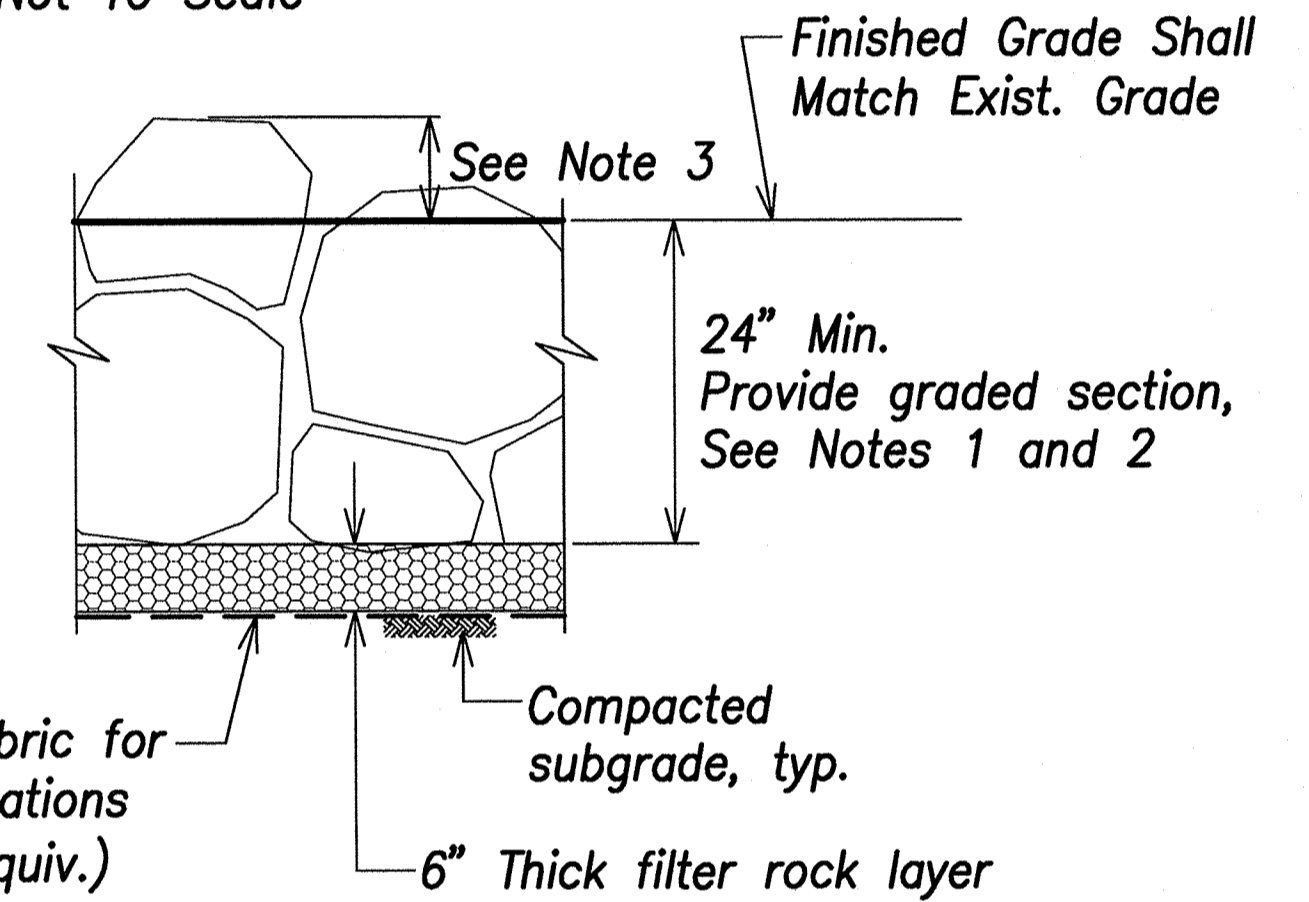
Notes:

- Compost shall not contain biosolids and should be consistent with EPA guidelines as well as meet all local, state and federal quality requirements.
- Contractor shall inspect compost filter socks when as required by the project SWPPP.

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
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| HAWAII | HAW. | BR-083-1(48) | 2021 | 38 | 161 |



**STABILIZED CONSTRUCTION ENTRANCE
Not To Scale**



Geotextile filter fabric for stabilization applications (Mirafi 170N or equiv.)
6" Thick filter rock layer
24" Min. Provide graded section, See Notes 1 and 2
Finished Grade Shall Match Exist. Grade

Notes:

- Line basin with 2 layers of 4 mil. polyethylene plastic.
- Place sand bags on top sheeting.
- Clean out hardened concrete to maintain basin capacity.

Notes:

- Riprap shall be basalt rock and consist of 8" average stone size, 12" maximum stone size.
- Riprap gradation:
D₈₅ = 10"
D₅₀ = 8"
D₁₅ = 4"
- 6" Max. from highest adjacent rock finish top.

**TEMPORARY DUMPED RIPRAP
Not to Scale**

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| DESIGNED BY | DATE |
| DRAWN BY | |
| CHECKED BY | |
| IN CHARGE BY | |
| APPROVED BY | |
| DATE | |

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Walter G. C. Chong
4/30/22
SIGNATURE LIC. EXPIRATION
R. M. TOWILL CORPORATION

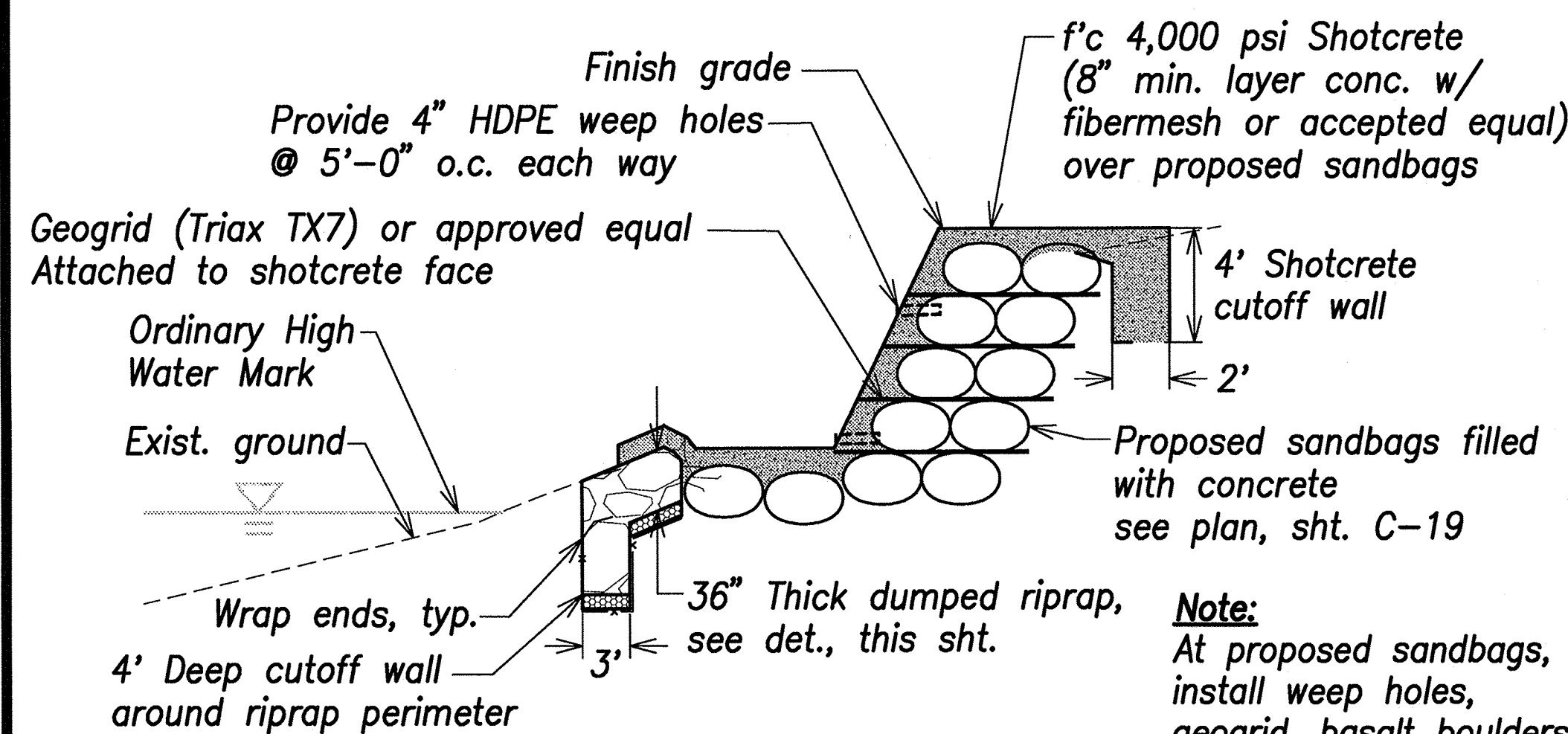
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**EROSION & SEDIMENT
CONTROL DETAILS**

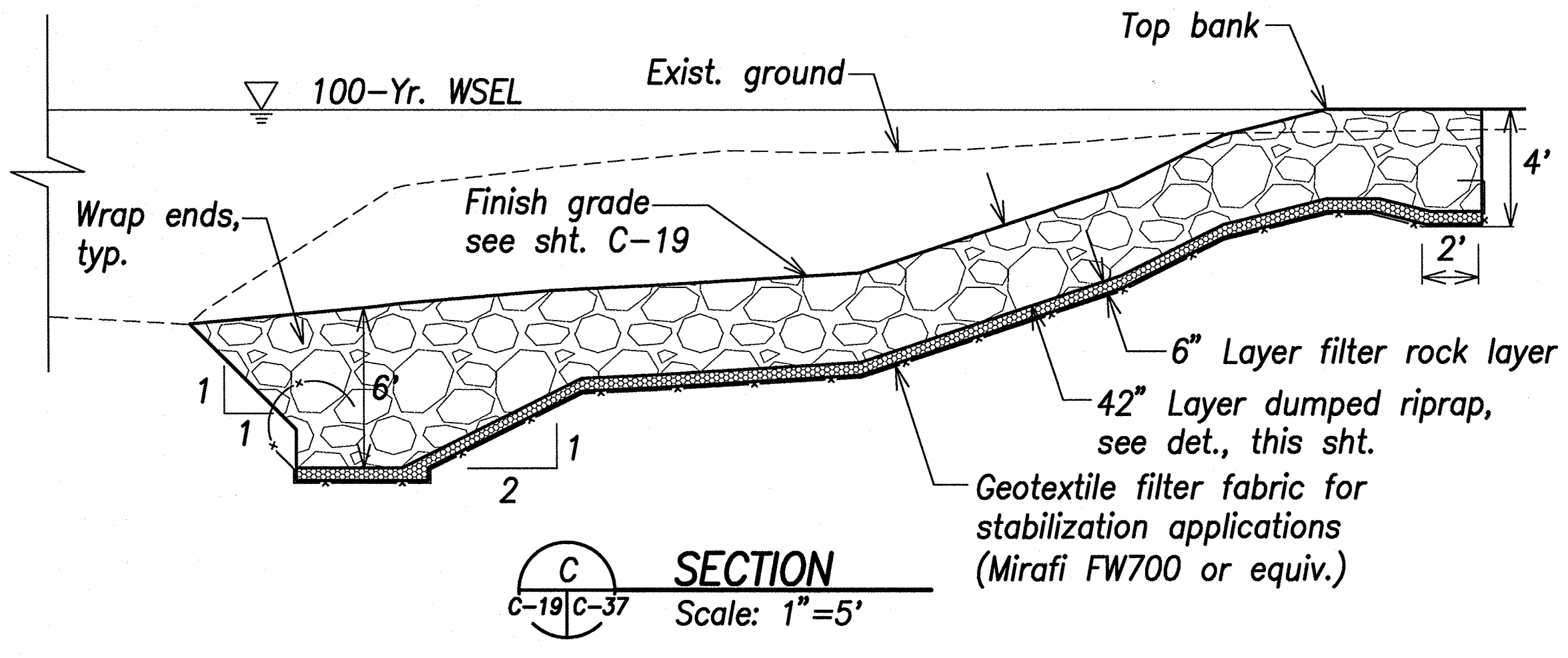
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

Scale: As Noted Date: February 2021

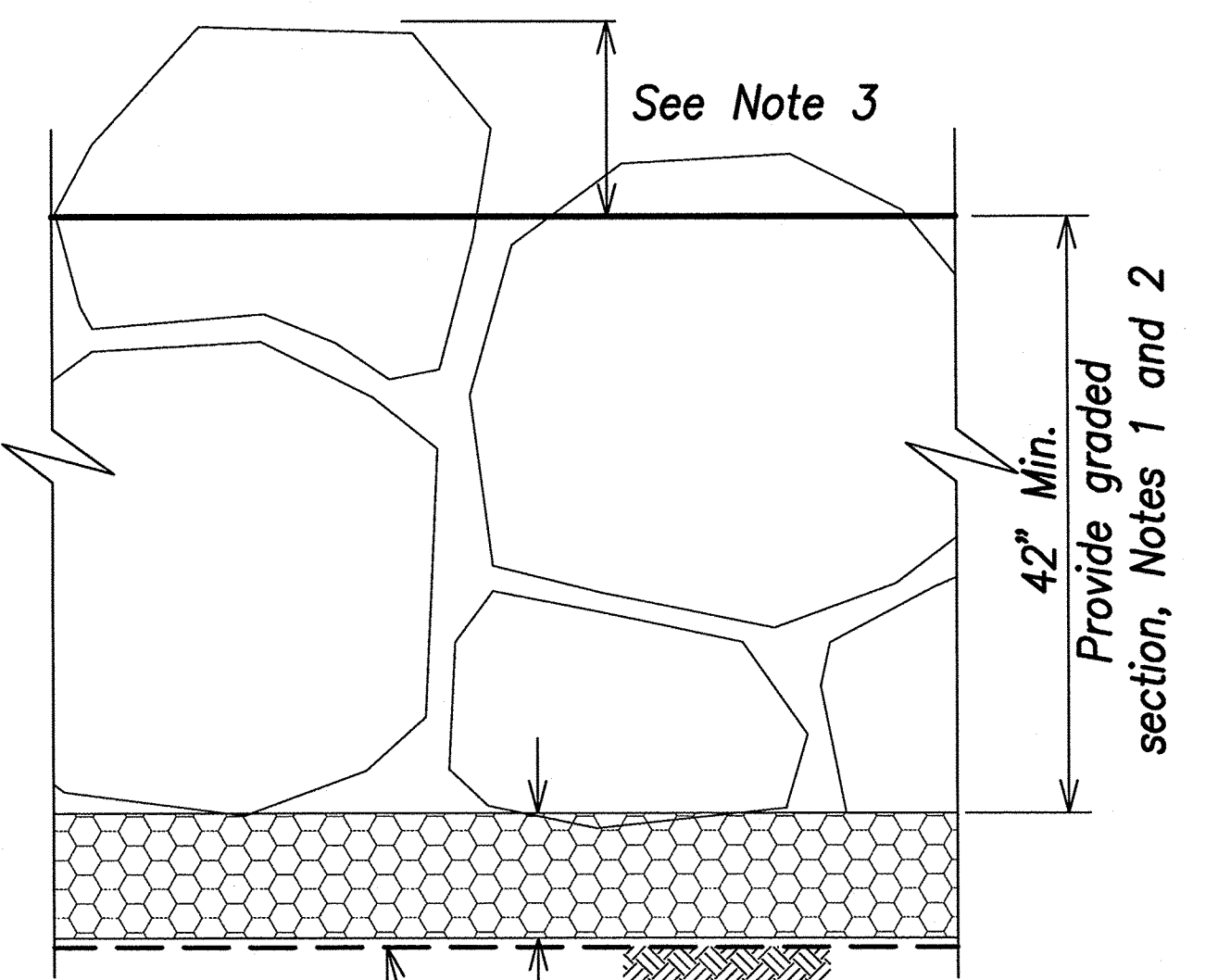
| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 39 | 161 |



TYPICAL SECTION - NEW SANDBAGS
Scale: 1"=5'

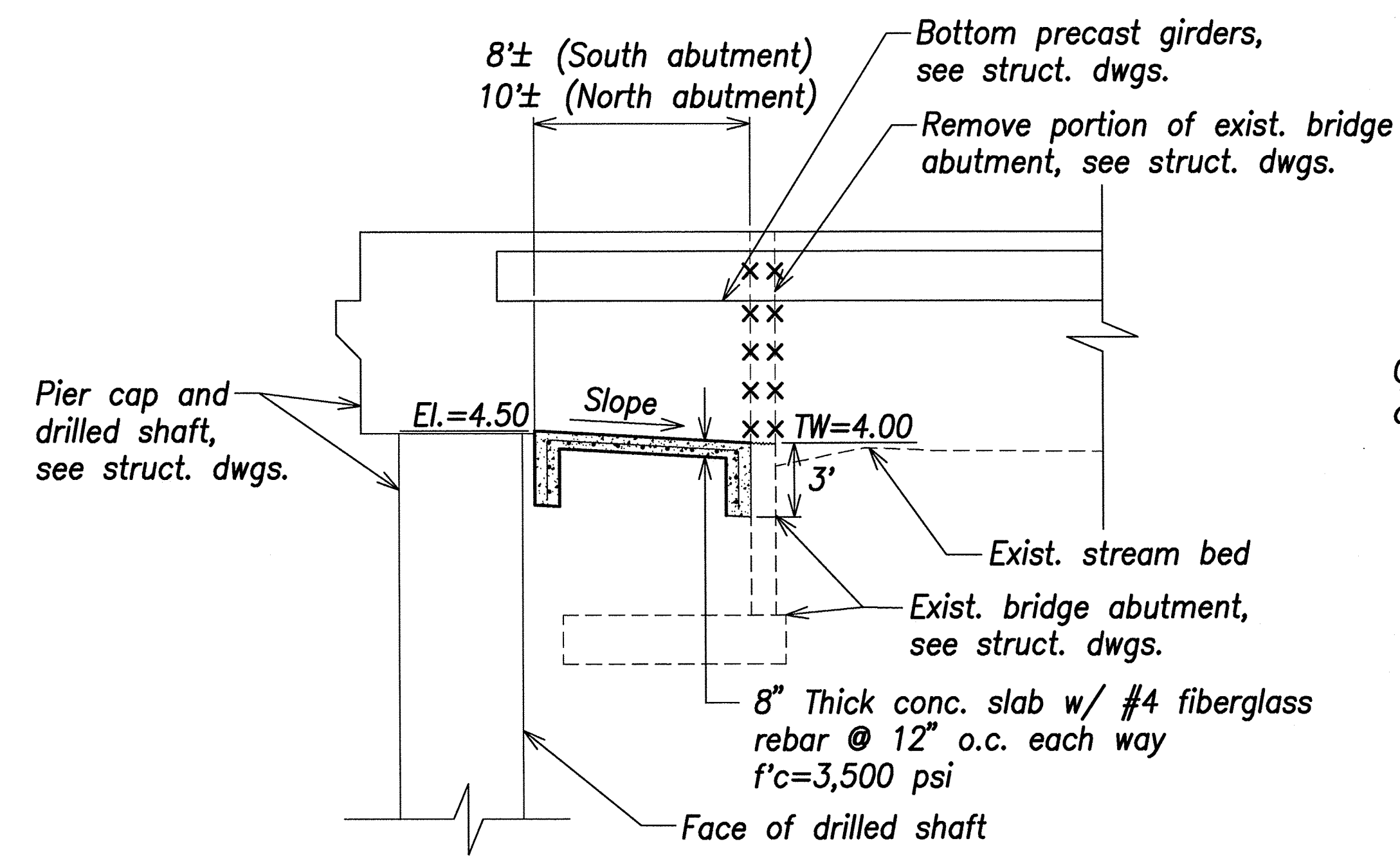


SECTION C
C-19/C-37 Scale: 1"=5'

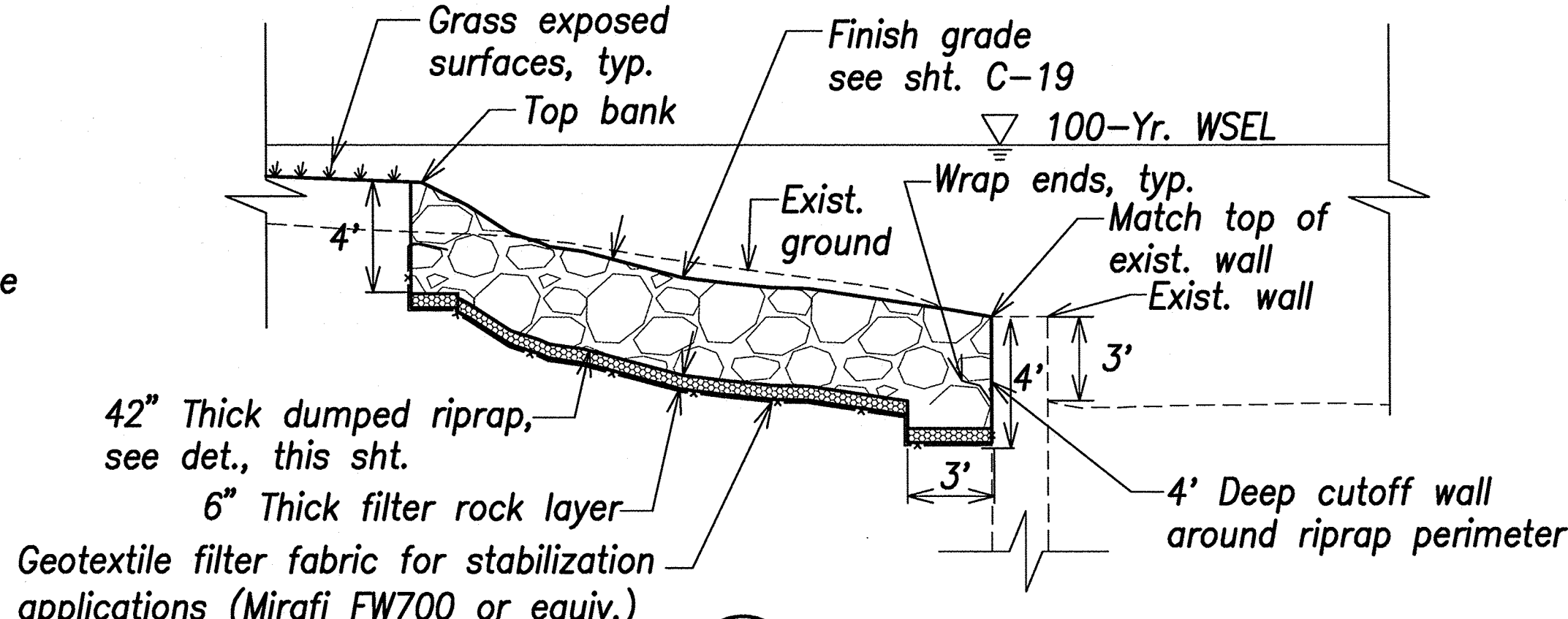


Geotextile filter fabric for stabilization applications (Mirafi FW700 or equiv.)
6" Thick filter rock layer

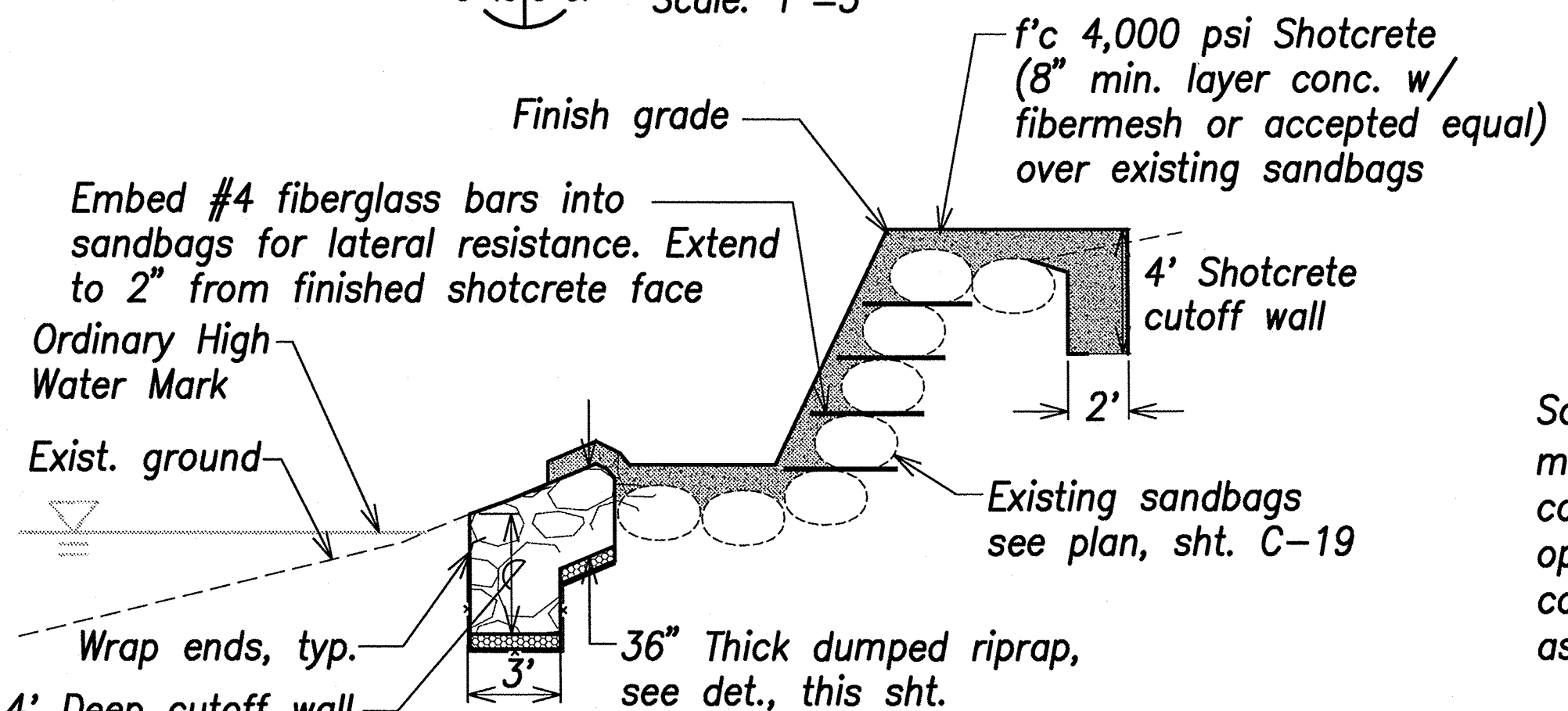
- Notes:**
- Riprap shall be basalt rock and consist of 27" average stone size.
 - Riprap gradation:
 $D_{100} = 2.85' \text{ 2,000 lbs}$
 $D_{50} = 2.25' \text{ 1,000 lbs}$
 $D_{10} = 1.80' \text{ 500 lbs}$
 - 12" Max. from highest adjacent rock finish top.



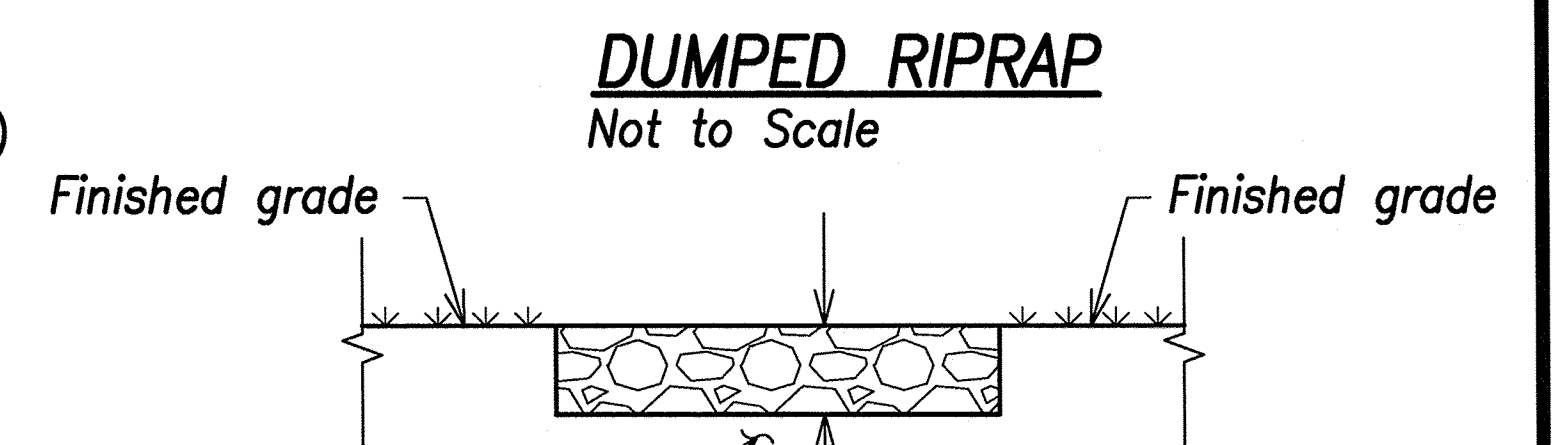
SECTION A
C-19/C-37 Scale: 1"=5'



SECTION D
C-19/C-37 Scale: 1"=5'

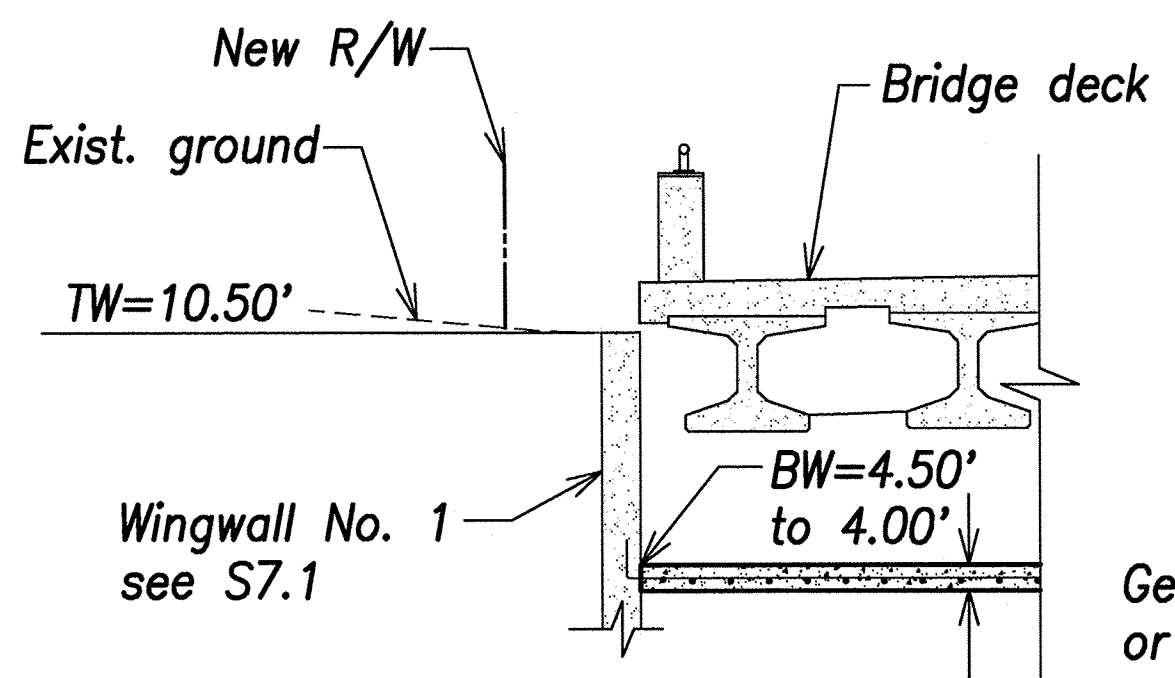


SECTION E
C-19/C-37 Scale: 1"=5'

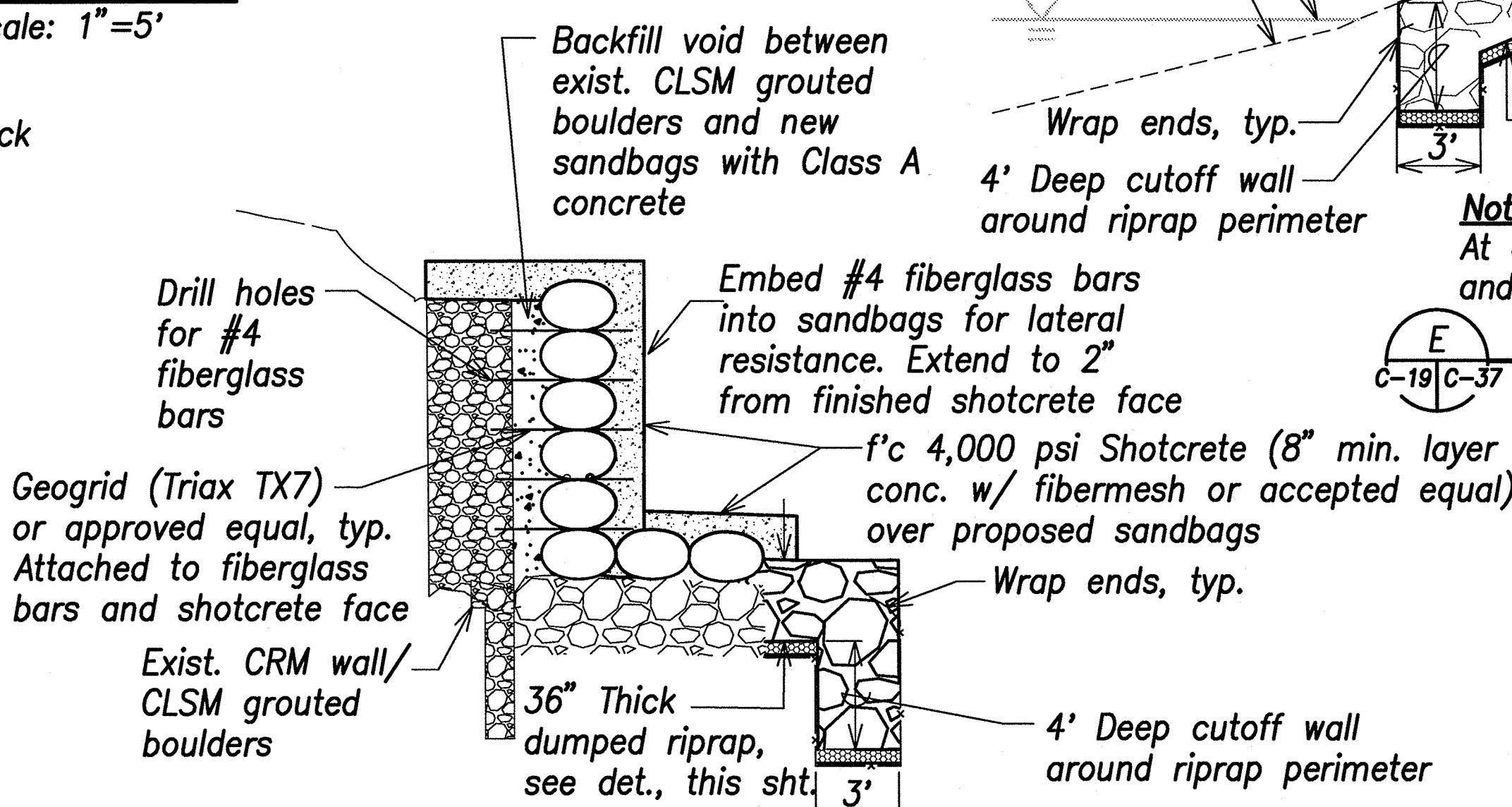


Scarify existing subgrade to a minimum depth of 6" and moisture condition to slightly above optimum moisture content, and compacted to 95% compaction as determined by ASTM D 1557.

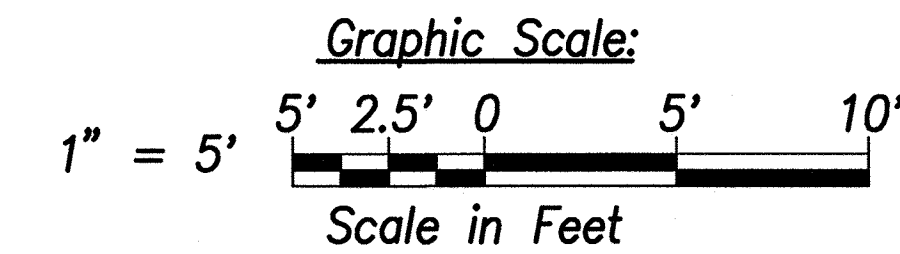
GROUTED RIPRAP SECTION
Not to Scale



SECTION B
C-19/C-37 Scale: 1"=5'

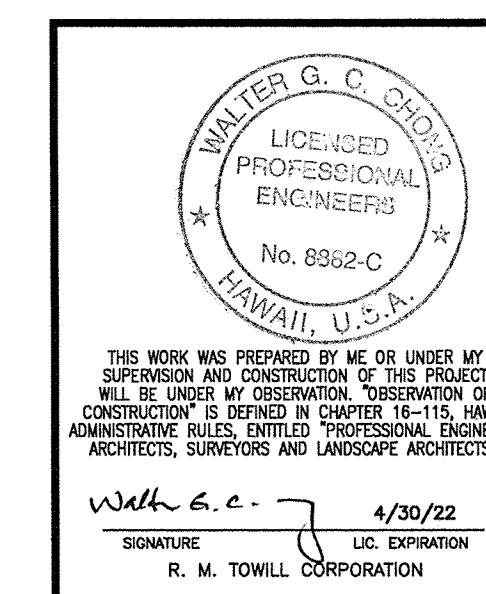


TYPICAL SECTION - NEW SANDBAGS AT CRM WALL
Scale: 1"=5'



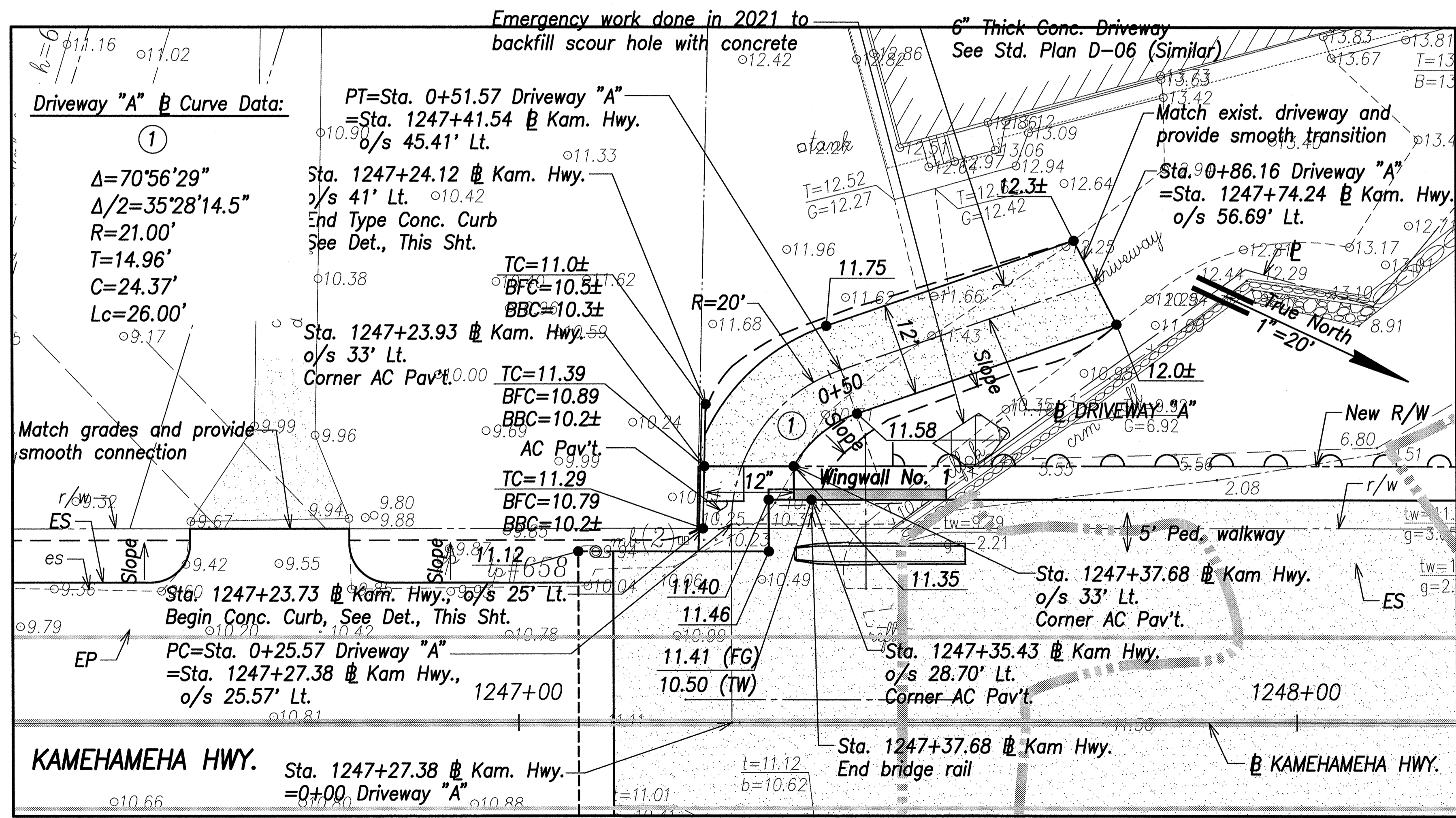
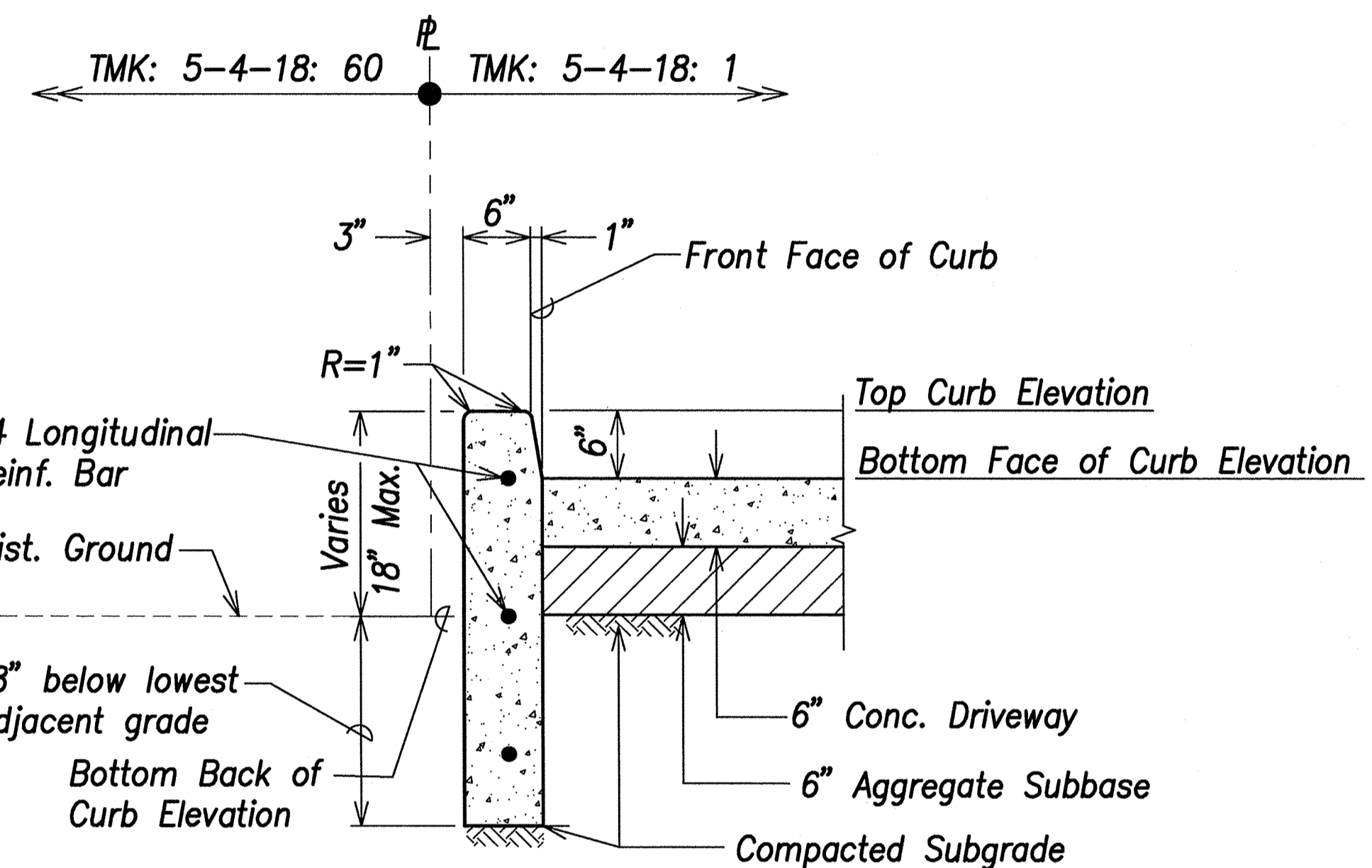
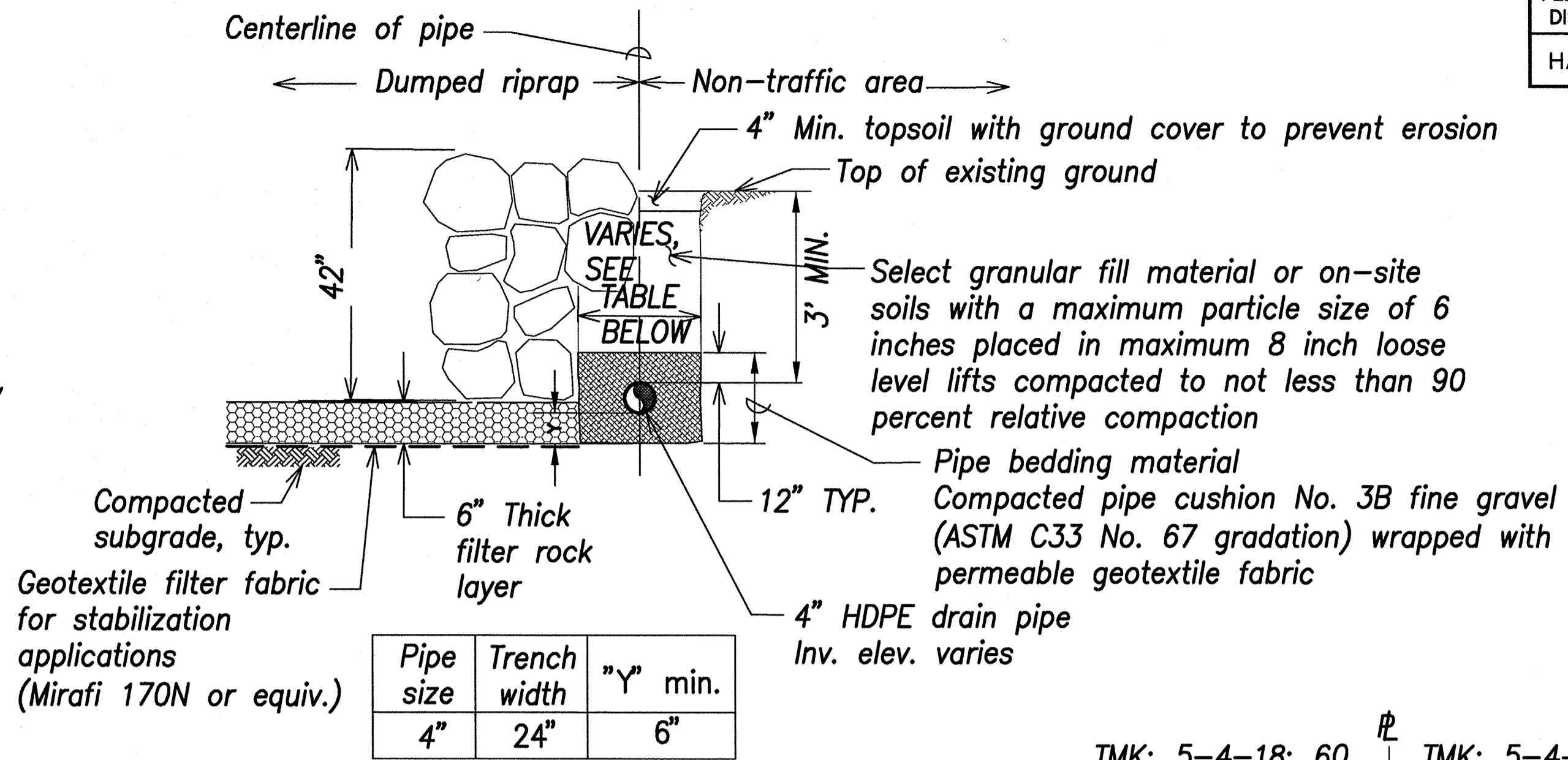
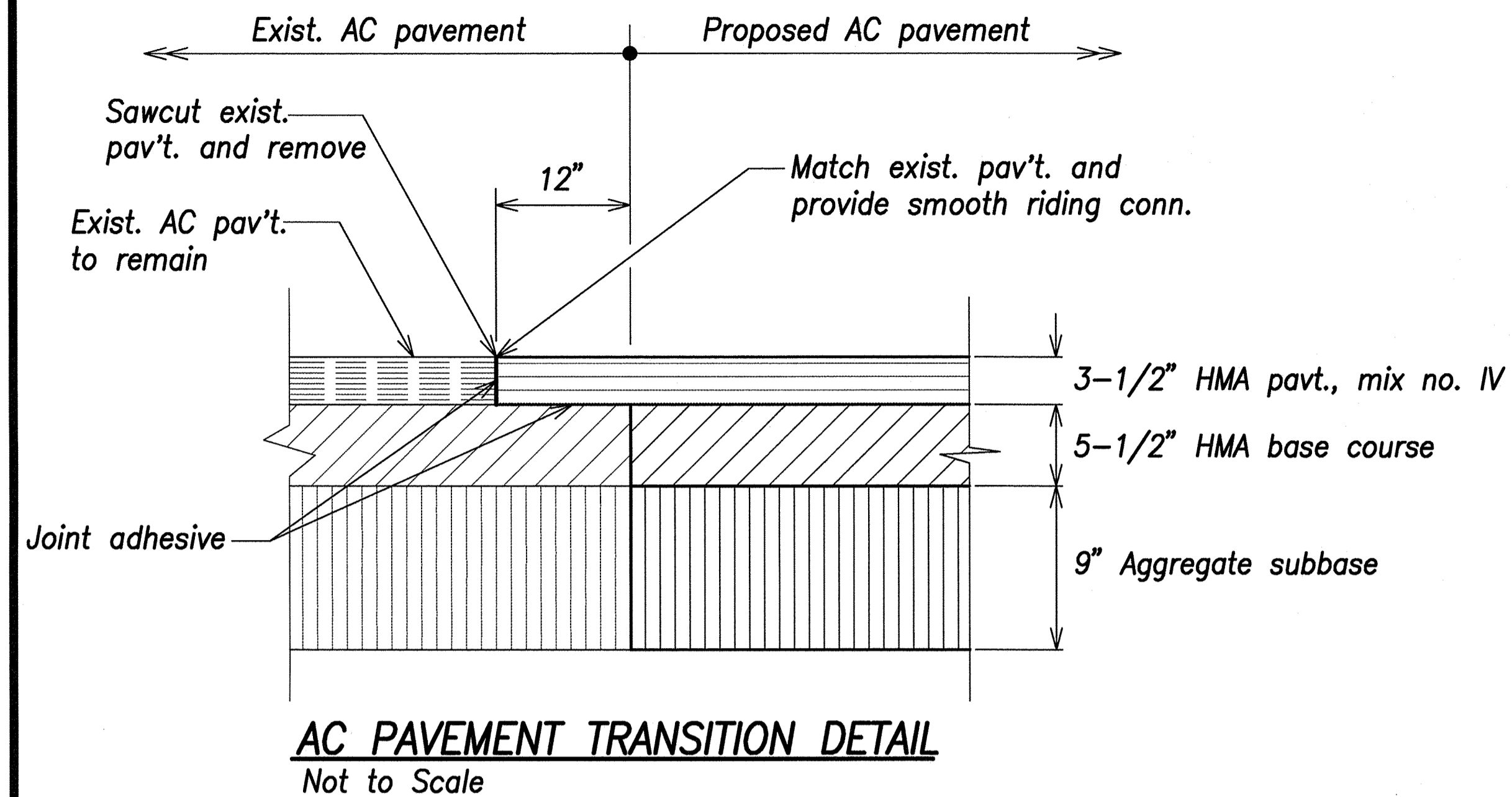
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| DATE | BY |
| DESIGNED BY | WFC |
| TRACED BY | |
| QUANTITIES BY | |
| CHECKED BY | |
| NO. | |

Note:
Concrete shall be f'c=3,500 psi.

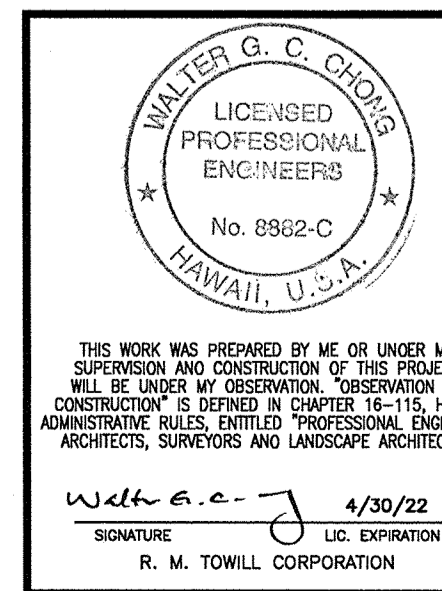
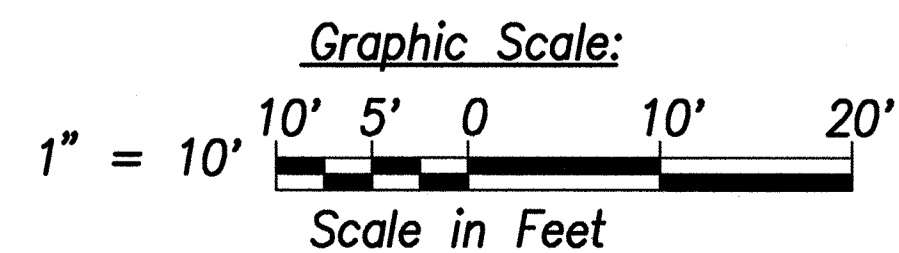


STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STREAM BANK STABILIZATION & MISCELLANEOUS DETAILS
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)
Scale: As Noted Date: February 2021
SHEET No. C-37 OF SHEETS

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 40 | 161 |



- Legend:**
- 10.00 Finished Grade Elevation
 - TC=11.29 Top Curb Elevation
 - BFC=10.79 Bottom Face of Curb Elevation
 - BBC=10.2± Bottom Back of Curb Elevation



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**DRIVEWAY "A" RECONSTRUCTION PLAN
& AC PAVEMENT TRANSITION DETAIL**

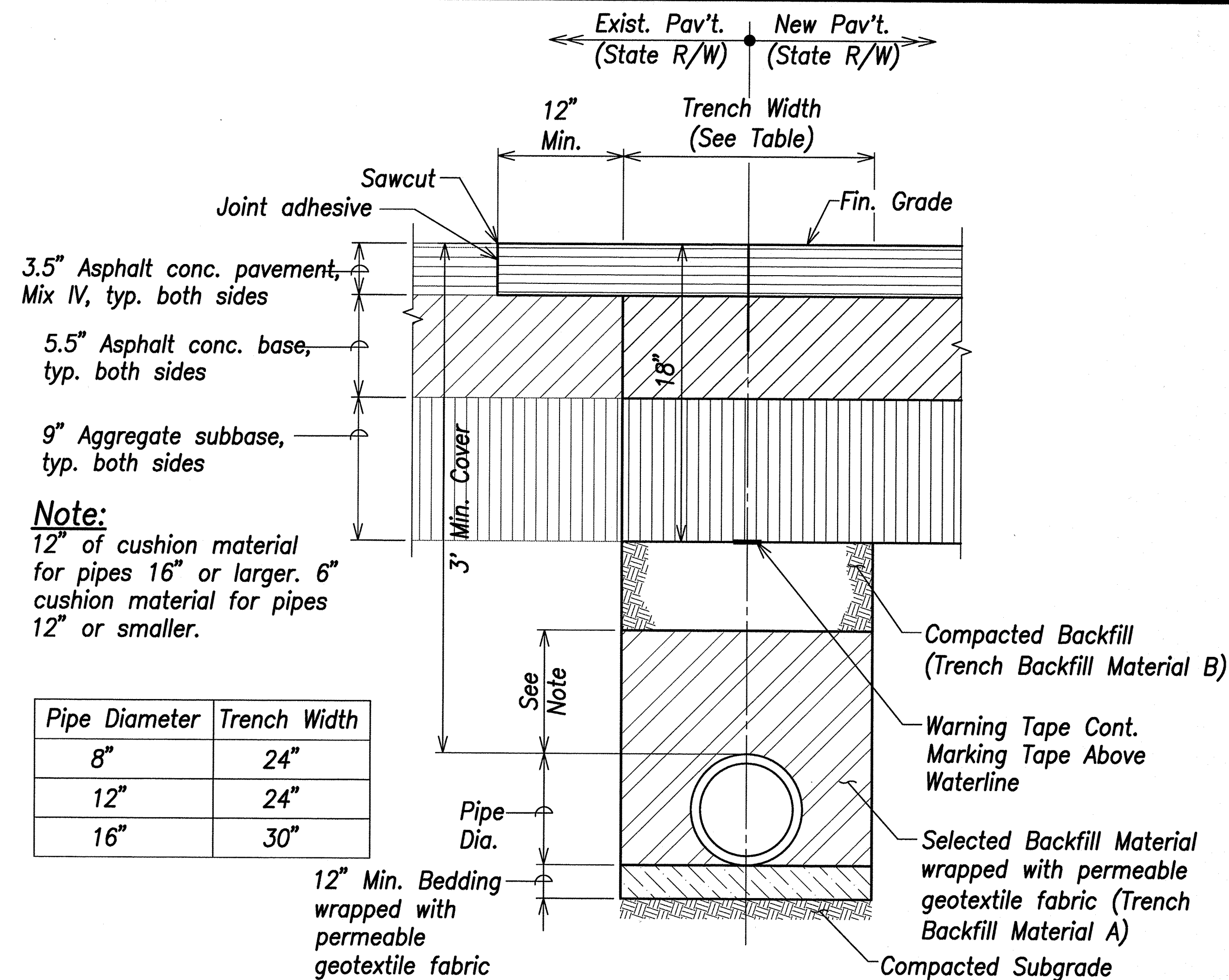
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. C-38 OF SHEETS

| | |
|-------------------|------|
| SURVEY PLOTTED BY | DATE |
| DRAWN BY | |
| DESIGNED BY | |
| QUANTITIES BY | |
| CHECKED BY | |
| ORIGINAL PLAN | |
| NOTE BOOK | |
| No. | |

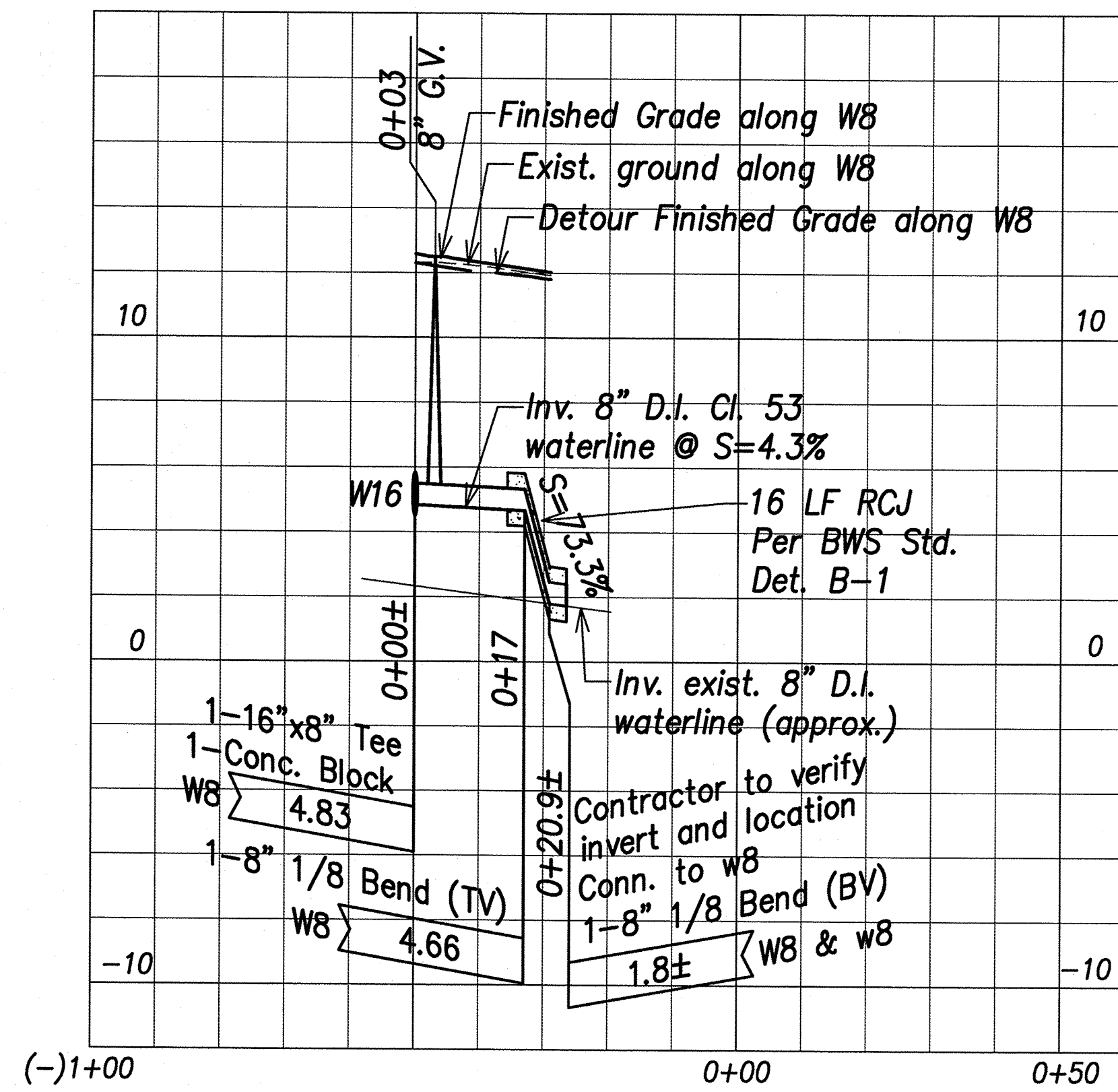
| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 41 | 161 |



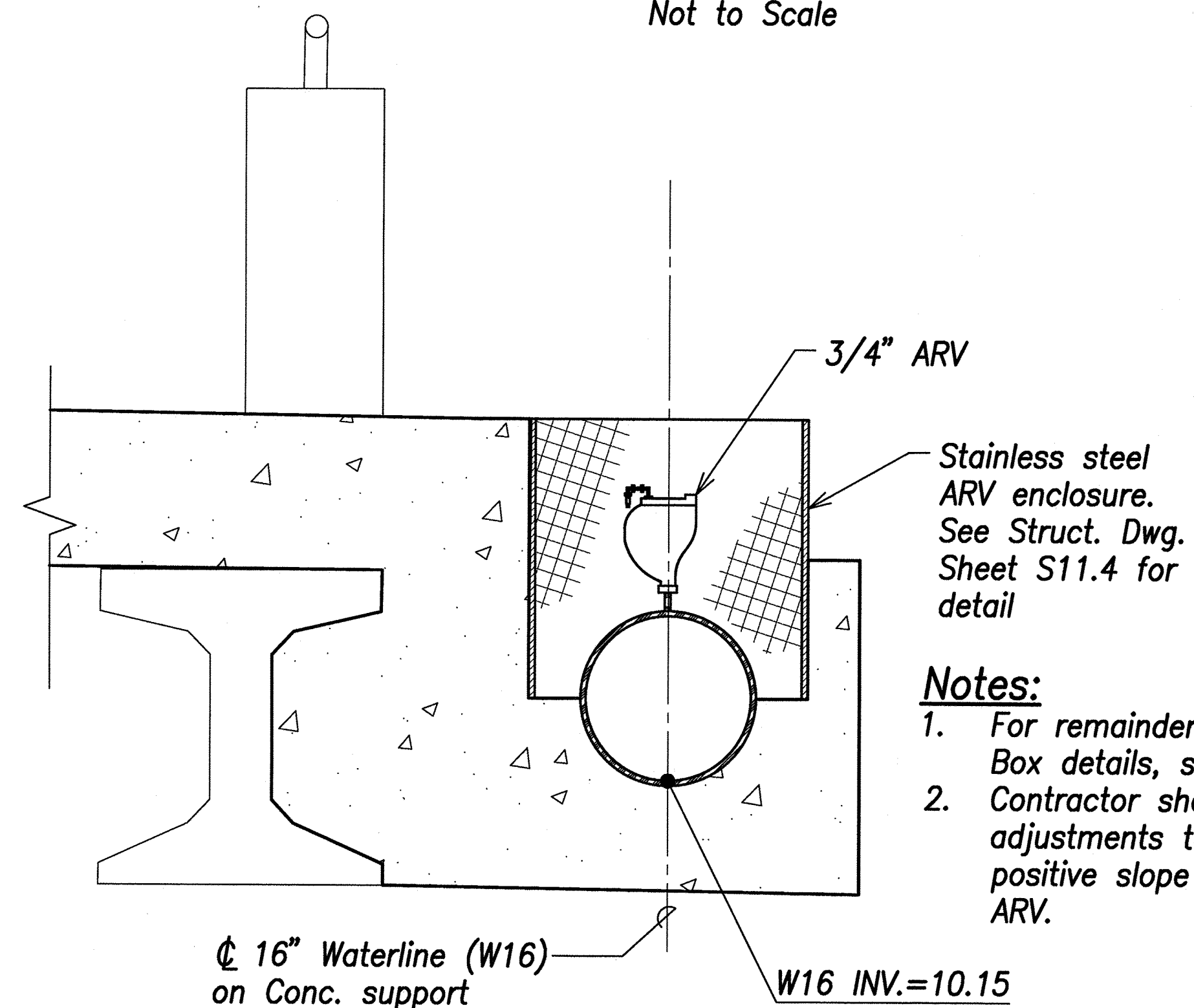
Note:
12\"/>

| Pipe Diameter | Trench Width |
|---------------|--------------|
| 8" | 24" |
| 12" | 24" |
| 16" | 30" |

WATERLINE TRENCH DETAIL
Not to Scale

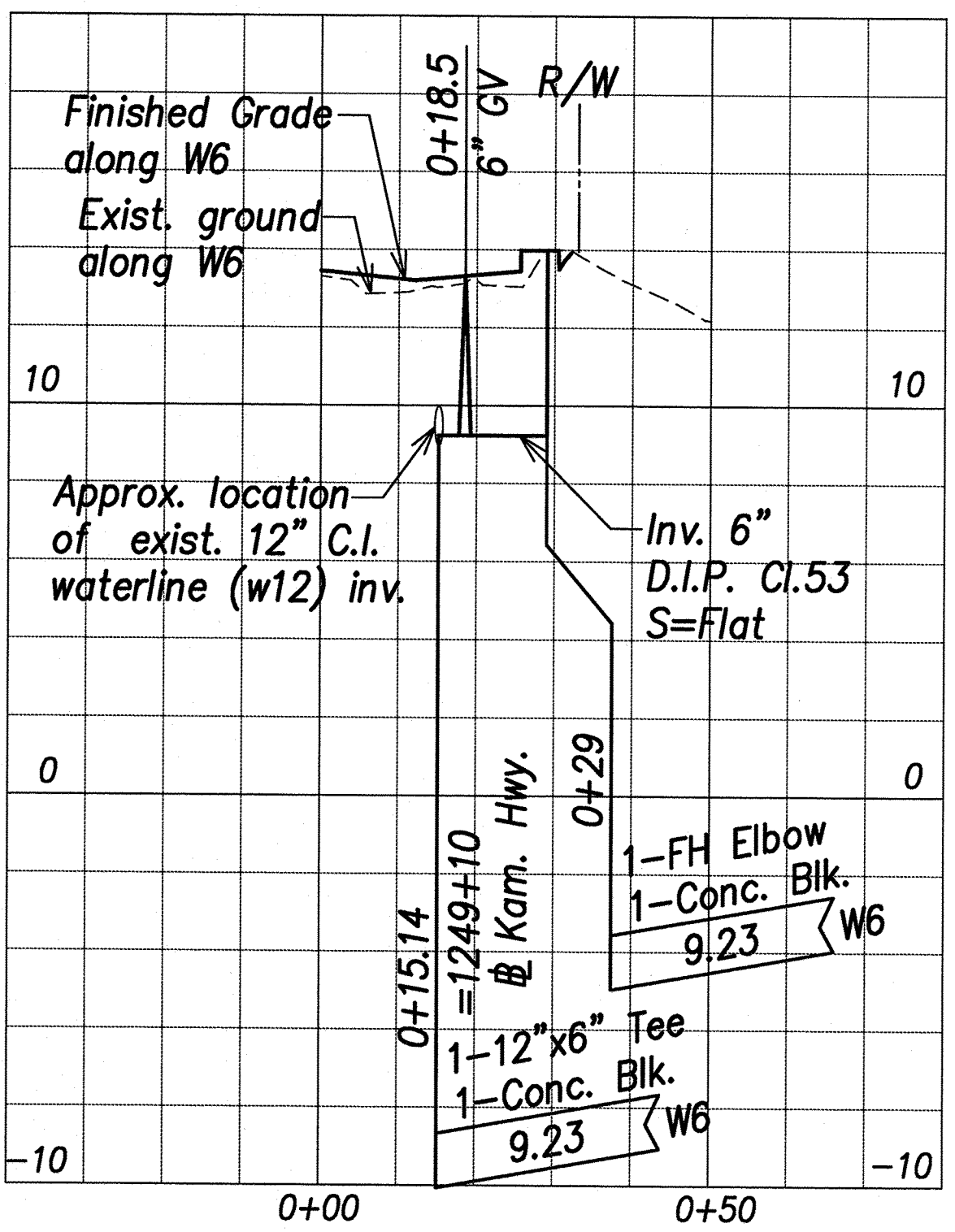


8-INCH PIPILANI PL. WATERLINE PROFILE
Scales: 1"=20' Horiz.
1"=4' Vert.

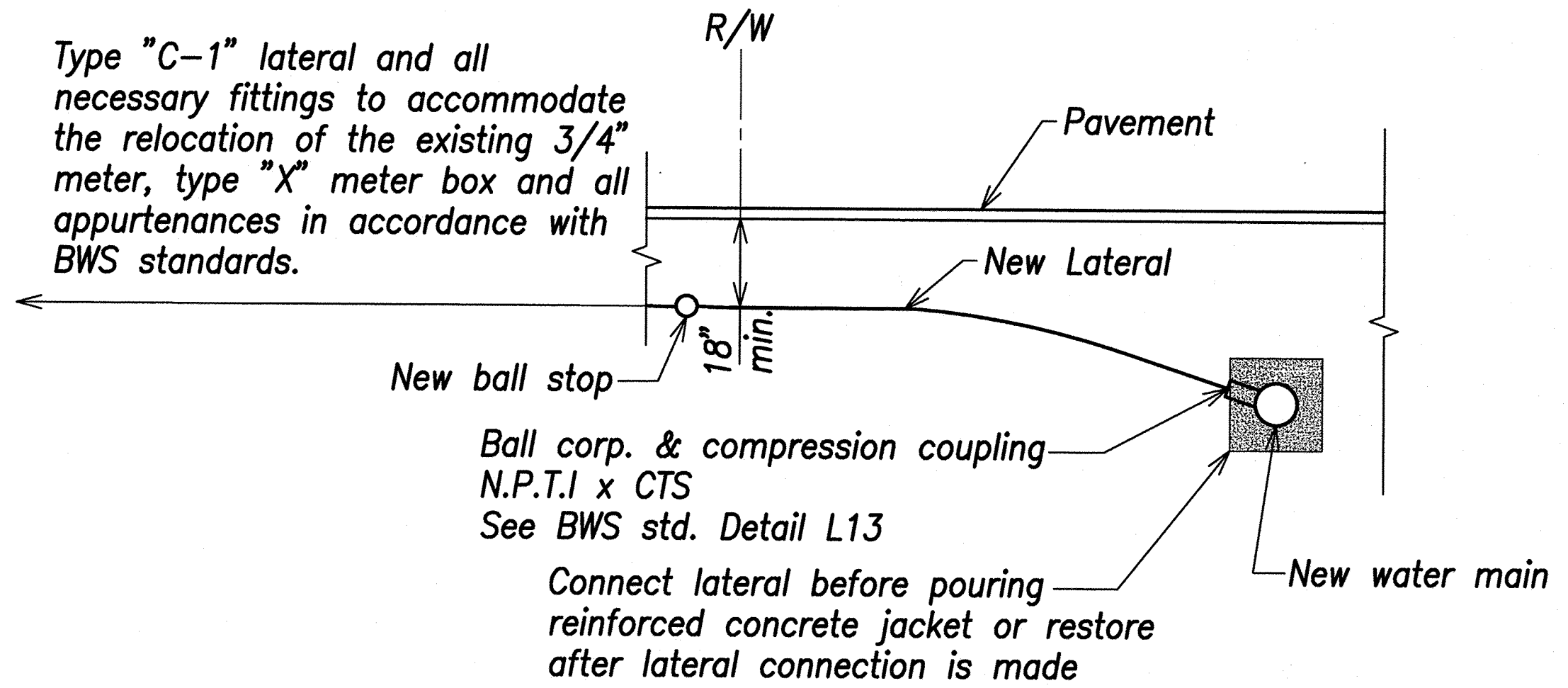


3/4-INCH ARV AND VALVE ENCLOSURE (W16) DETAIL
Not to Scale

- Notes:**
- For remainder of 3/4" ARV and Valve Box details, see BWS Std. Det. V2.
 - Contractor shall make necessary adjustments to maintain a zero to positive slope of lateral going to the ARV.




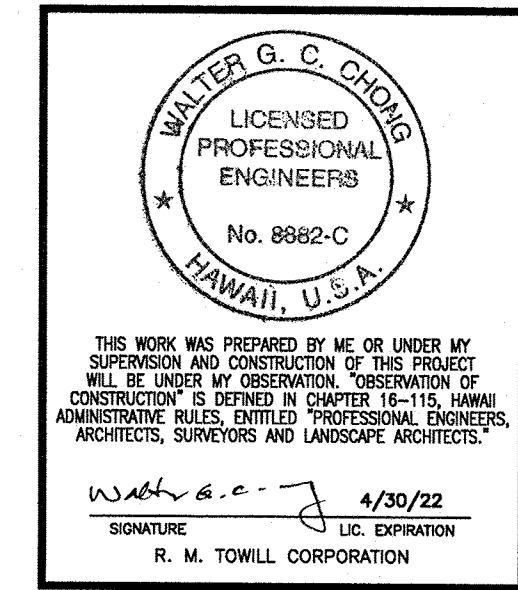
FH LATERAL PROFILE
Scales: 1"=20' Horiz.
1"=4' Vert.



DETAIL SERVICE LATERAL CONNECTION AT CONC. JACKET
Not to Scale

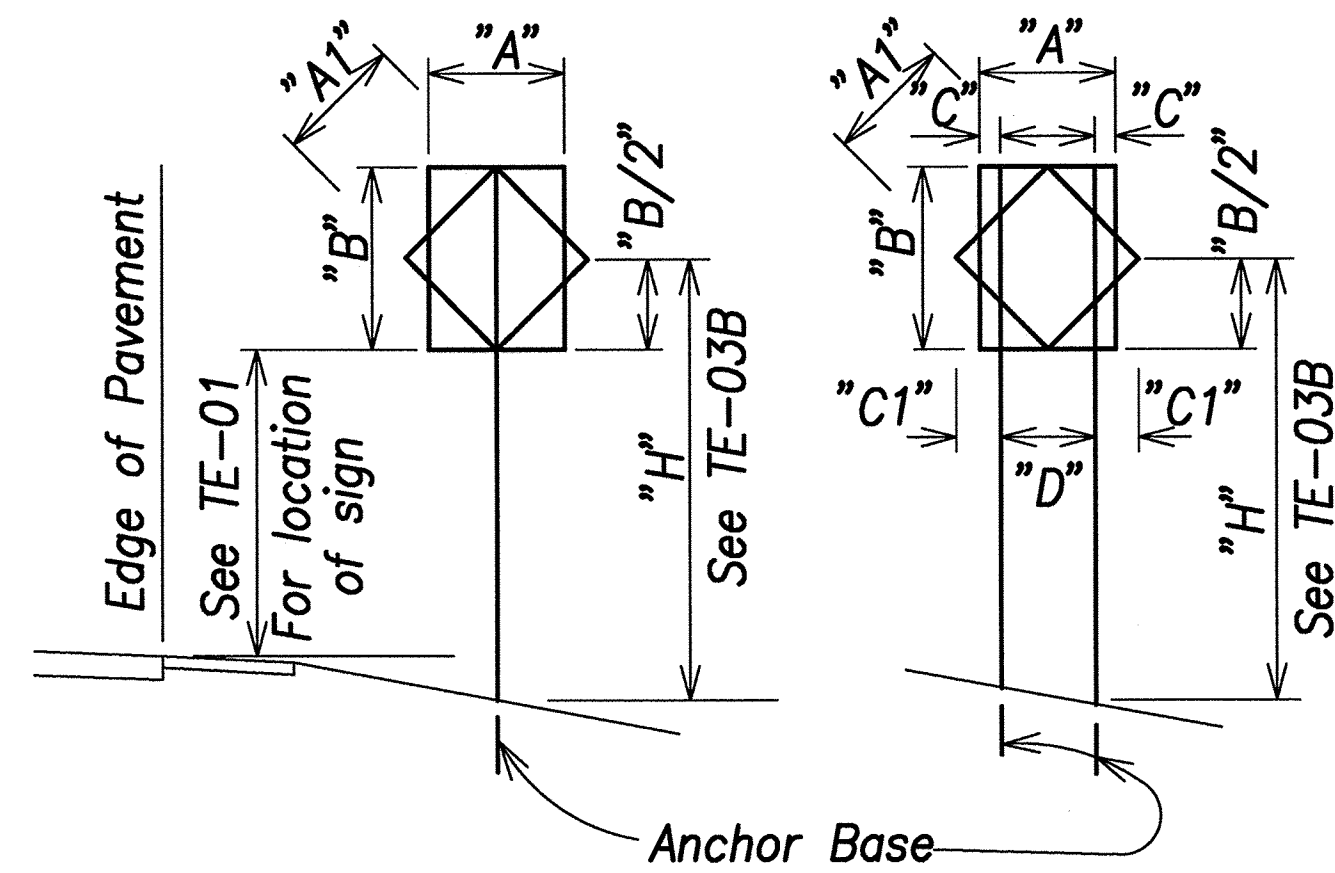
| | |
|---------------|------|
| DESIGNED BY | DATE |
| DRAWN BY | |
| CHECKED BY | |
| NOTED BY | |
| QUANTITIES BY | |
| NO. | |

APPROVED:  DATE: MAY 24 2021
Manager and Chief Engineer, BWS
(for work affecting BWS facilities
State R/W & BWS easements only)



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**8-INCH WATERLINE PROFILES
& WATERLINE DETAILS**
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)
Scale: As Noted Date: February 2021

| | | | | | |
|---------------------|-------|--------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 43 | 161 |



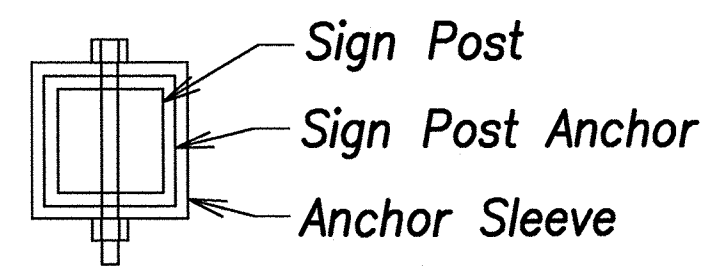
1 - POST
"A" or "A1" less than 36"

2 - POST
"A" or "A1" less than 60"

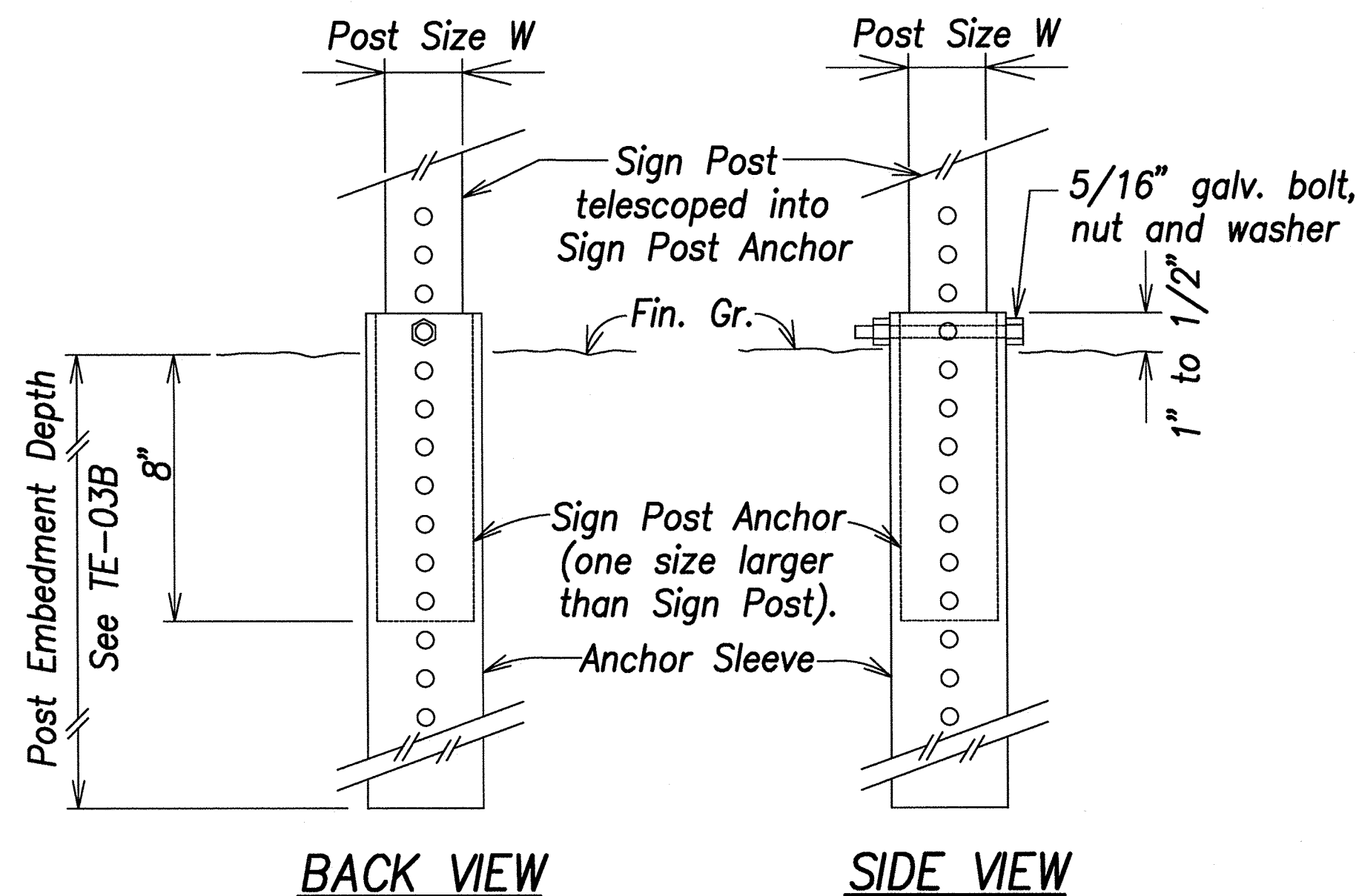
| "A" or "A1" | "C" | "C1" |
|------------------------------------|-----|------|
| Less than 36" | 6" | - |
| Greater than 36" and less than 48" | 9" | 19" |
| Greater than 48" | 12" | 24" |

NOTE:
Frame stiffeners are required when D is greater than 24"
See General Notes.

TYPICAL INSTALLATION
Not to Scale



TOP VIEW



BACK VIEW

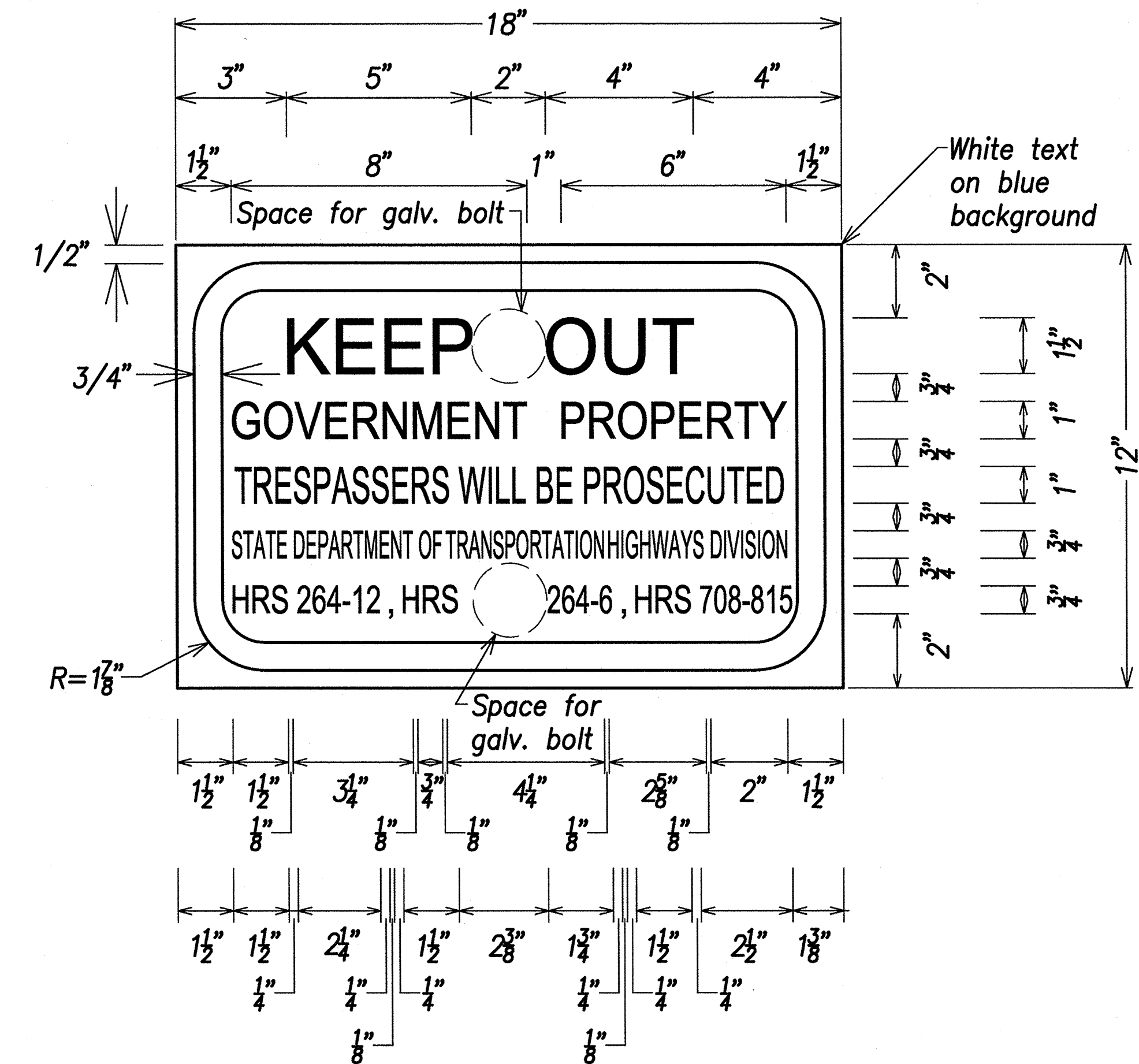
SIDE VIEW

SIGN POST INSTALLATION

ANCHOR BASE DETAIL
Not to Scale

GENERAL NOTES:

- Design Specifications:**
 - Design shall conform w/ the latest AASHTO Standard Specifications for the Structural Supports for Highway Signs, Luminaires & Traffic Signals and its interim supplements and modifications by the Highways Division, Department of Transportation State of Hawaii.
 - Latest HDOT Memorandum with subject title "Design Criteria for Bridges and Structures."
- Loads:**
 - Basic Wind Speed: 105 mph.
 - Recurrence Interval of 10 years.
- Materials:**
 - Post shall conform to the Standard Specifications.
 - All connection bolts shall be AASHTO M164 bolts and anchor bolts shall be AASHTO M314-105 bolt.
 - Lap splice nuts and bolts shall be M180, with an ultimate tensile strength of 180 ksi, min.
 - Aluminum members and surfaces in contact with structural steel shall be isolated with neoprene materials as approved by the Engineer.
- General:**
 - See General Notes on B-01, TE-01, and TE-03B for additional information.
 - All posts shall be 12 gage unless otherwise specified or shown on the plans.
 - Square tube posts shall be perforated with 3/8" holes, 1" o.c., 4 sides, along entire length of post.
 - All accessories, fittings and stiffener details (as required) shall be submitted to the Engineer for approval 20 days prior to installation.
 - Alternate designs in accordance with the plans and specifications shall use the Service Load Design Method and shall be stamped by a registered structural engineer of the State of Hawaii and submitted to the Engineer for approval.
 - All sign support posts shall be outside of the clear zone or shielded by an appropriate traffic barrier system. The traffic barrier system shall be submitted to the Engineer for his approval.
 - The Contractor shall use templates while installing the anchor bolts. Anchor bolts shall be vertical.
 - Excavation and backfill shall be considered incidental to the cost of the sign foundation.



SIGN DETAIL
Scale: 1"=0.25'

| | |
|-------------|------|
| DESIGNED BY | DATE |
| DRAWN BY | |
| CHECKED BY | |
| IN CHARGE | |
| APPROVED BY | |
| NO. | |

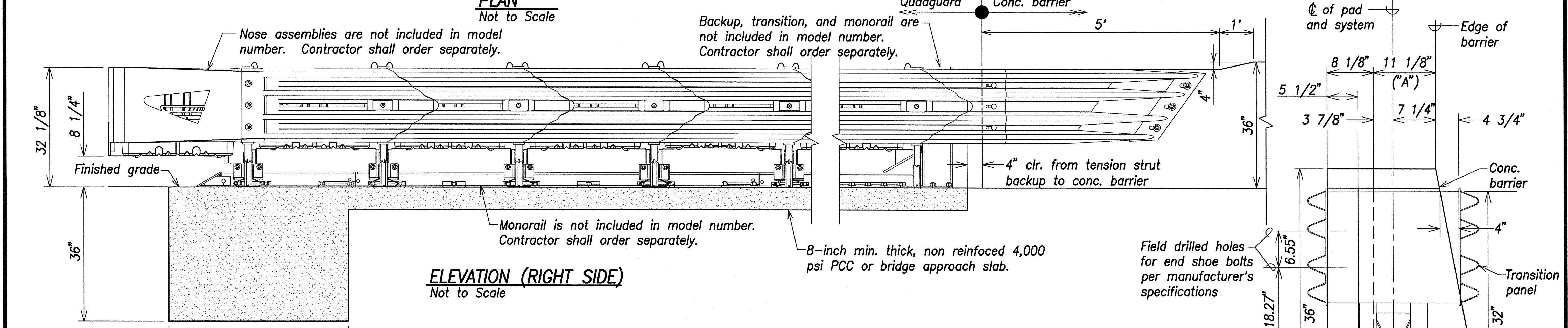
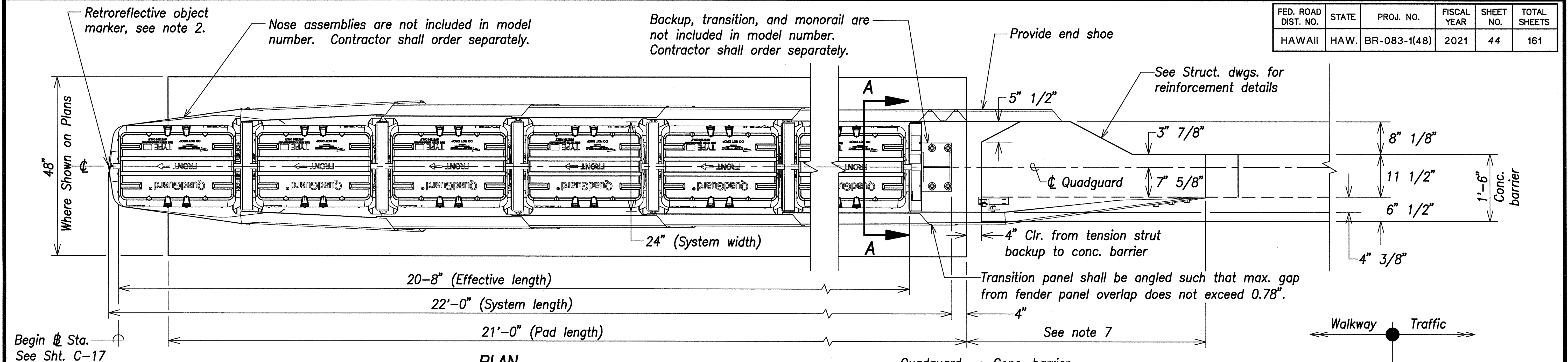
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**GALVANIZED SQUARE TUBE SIGN
POST MOUNTING & SIGN DETAIL**

Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

Scale: As Noted Date: February 2021

| | | | | | |
|---------------------|-------|--------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 44 | 161 |



| Bays | 24" width Model no. | System length | Effective length | Pad length | Max. design speed | No. of cartridges | |
|------|---------------------|---------------|------------------|------------|-------------------|-------------------|---------|
| | | | | | | Type I | Type II |
| 6 | QM10024 | 22'-0" | 20'-8" | 21'-0" | 62 mph | 3 | 3 |

Notes:

1. Install MASH Test Level 3 Quadguard Terminal Impact Attenuator or approved equal per manufacturer's recommendations.
2. The contractor shall order crash cushion object marker from the Quadguard manufacturer and install on the nose of the Quadguard per the manufacturer's specifications. Object marker shall be considered incidental to the Quadguard attenuator.
3. In compliance with the AASHTO 2011 Roadside Design Guide, manufacturer recommends removal of all curbs and islands to ensure proper impact performance.
4. Provision shall be made for rear fender panels to slide reward upon impact 30 inches, min.
5. 6" min. reinforced 4,000 PSI PC concrete pad or 8" min. non-reinforced 4,000 PSI concrete roadway, measuring at least 12'-0" wide by 50'-0" long. Anchor block is not required when using 8" concrete pad installed against an immovable structure such as a concrete wall or abutment.
6. See the "Quadguard M10 System Product Manual" for a description of its impact performance characteristics and design limitations before placing a system at a given site.
7. Where necessary, the customer shall supply an adequate transition from the Quadguard M10 system to the object being shielded.
8. Backup, monorail, and nose assemblies are not included in model number, order separately.

| | |
|---------------|------|
| DESIGNED BY | DATE |
| CHECKED BY | |
| QUANTITIES BY | |
| TRACED BY | |
| REVISIONS | |
| NO. 1 | |
| NO. 2 | |
| NO. 3 | |
| NO. 4 | |
| NO. 5 | |
| NO. 6 | |
| NO. 7 | |
| NO. 8 | |
| NO. 9 | |
| NO. 10 | |

WALTER G. CHONG
 LICENSED PROFESSIONAL ENGINEERS
 No. 8582-C
 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. OBSERVATION OR CONSTRUCTION IS DEFINED IN CHAPTER 16-115, HAWAII ADMINISTRATIVE RULES, ENTITLED "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS."

Signature: [Signature] 4/30/22
 R. M. TOWILL CORPORATION

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

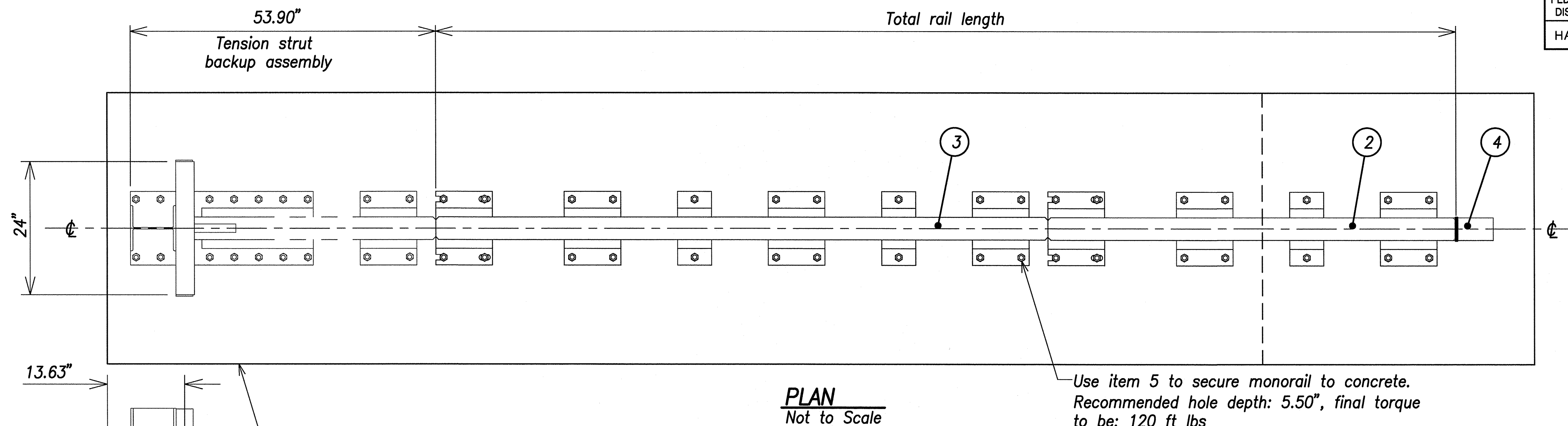
QUADGUARD DETAILS

*Kamehameha Highway
 Kaipapau Stream Bridge Replacement
 Federal Aid Project No. BR-083-1(48)*

Scale: As Noted Date: February 2021

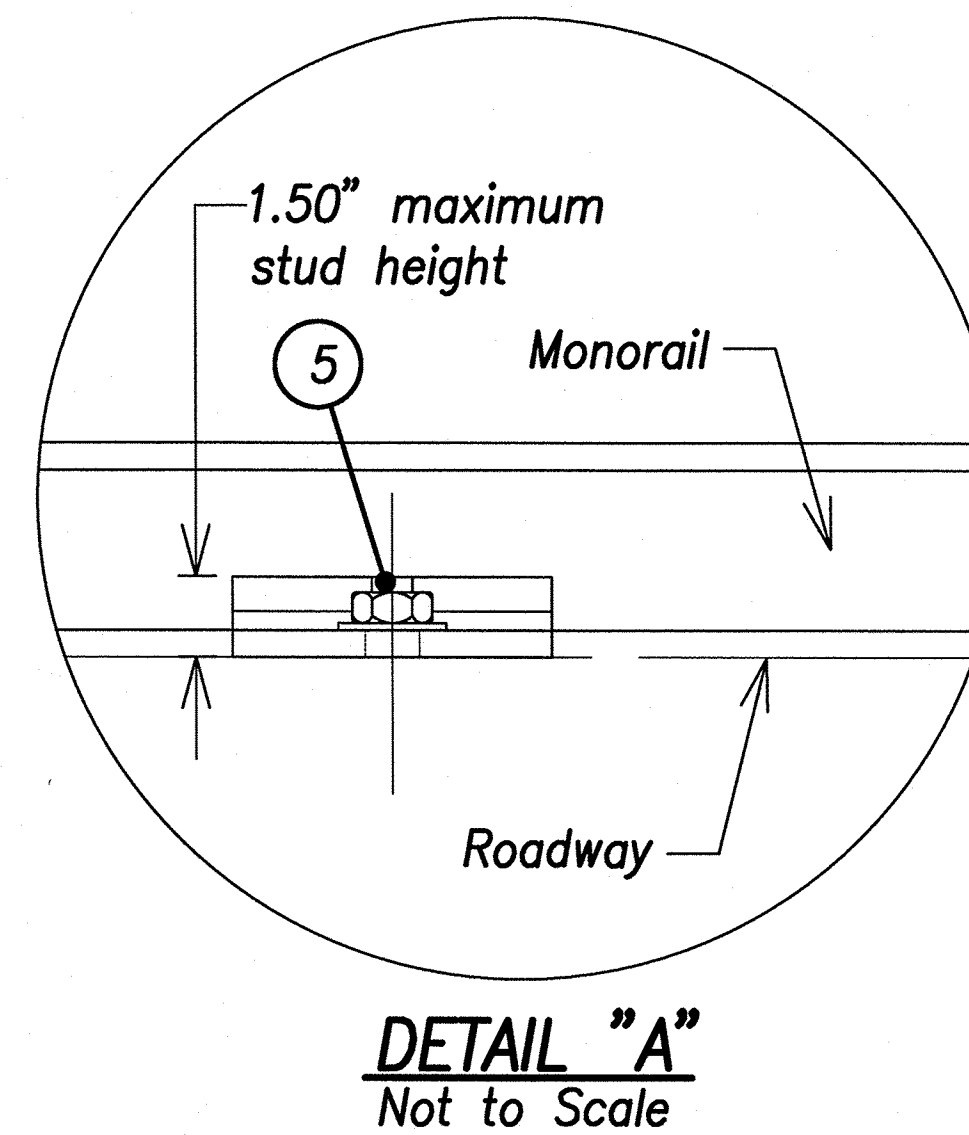
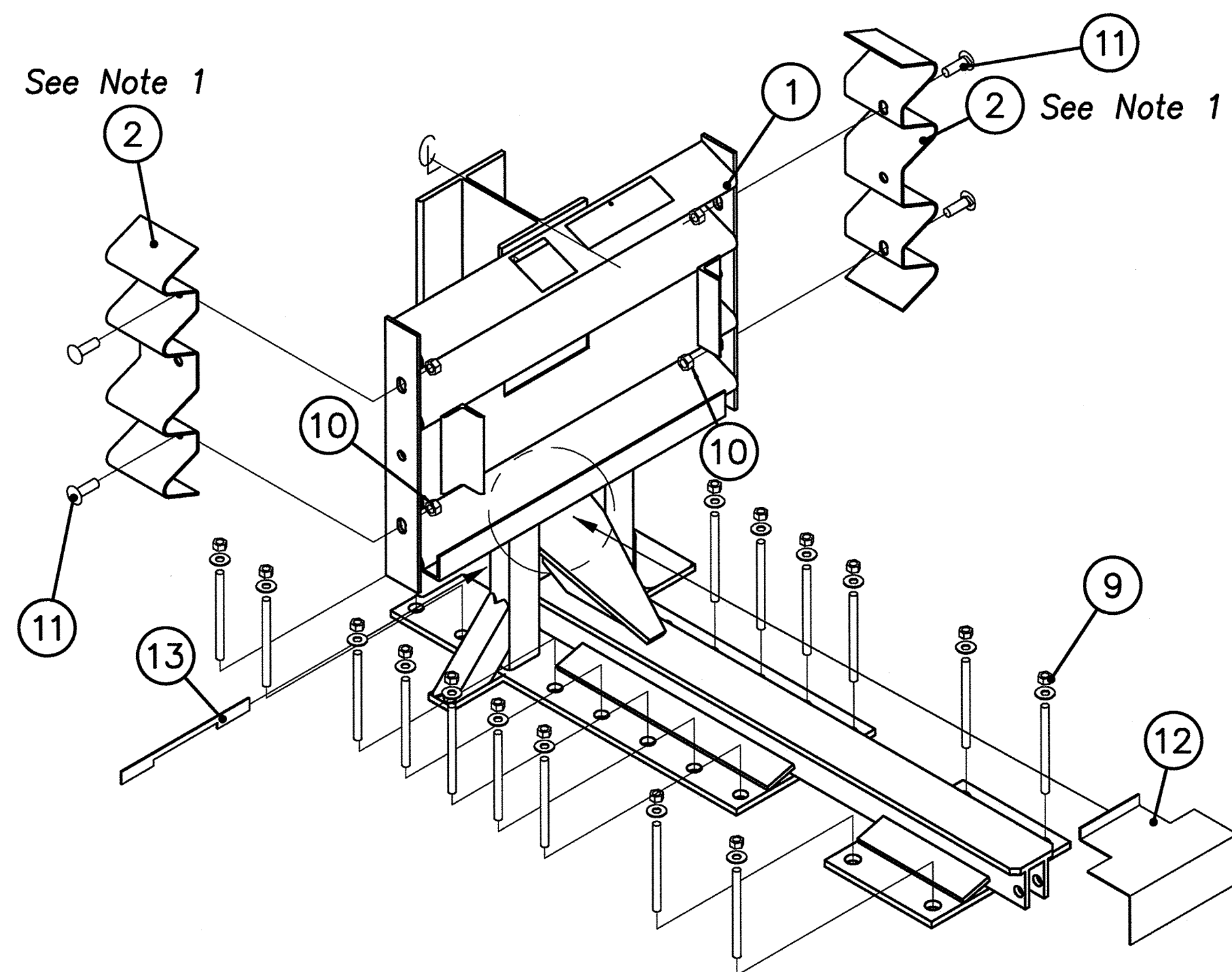
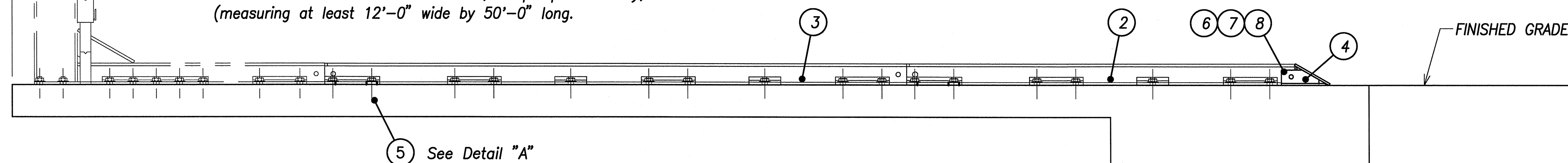
SHEET No. C-42 OF SHEETS

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 45 | 161 |



Note:
Monorail & backup assembly must be straight to within 0.5".

1. Min. 8" thick, 4,000 psi reinforced concrete deck structure.
2. 6" min. Reinforced 4,000 psi pcc pad.
3. 8" min. Non-reinforced continuous 4,000 psi pcc roadway, (measuring at least 12'-0" wide by 50'-0" long.



Notes:

1. Use monorail(s) (items 1, 2 and 3) as template(s) to locate mp-3 anchor bolts (item 5) and install per manufacturer's directions.
2. Cross slope of pad shall not exceed 2% in any direction.
3. Units of measurement are inches unless otherwise noted.
4. Every stud must be embedded to a depth of 5.50-inches. If rebar is encountered in a pcc pad, drill through it. If rebar is encountered on a deck structure, ask the engineer for direction.

| | |
|-------------|------|
| DESIGNED BY | DATE |
| DRAWN BY | |
| CHECKED BY | |
| IN CHARGE | |
| REVISION | |
| NO. | |

WALTER G. C. CHONG
LICENSED PROFESSIONAL ENGINEERS
No. 8892-C
HAWAII, U.S.A.

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Walter G. C. Chong 4/30/22
SIGNATURE LIC. EXPIRATION
R. M. TOWILL CORPORATION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

QUADGUARD DETAILS

*Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)*

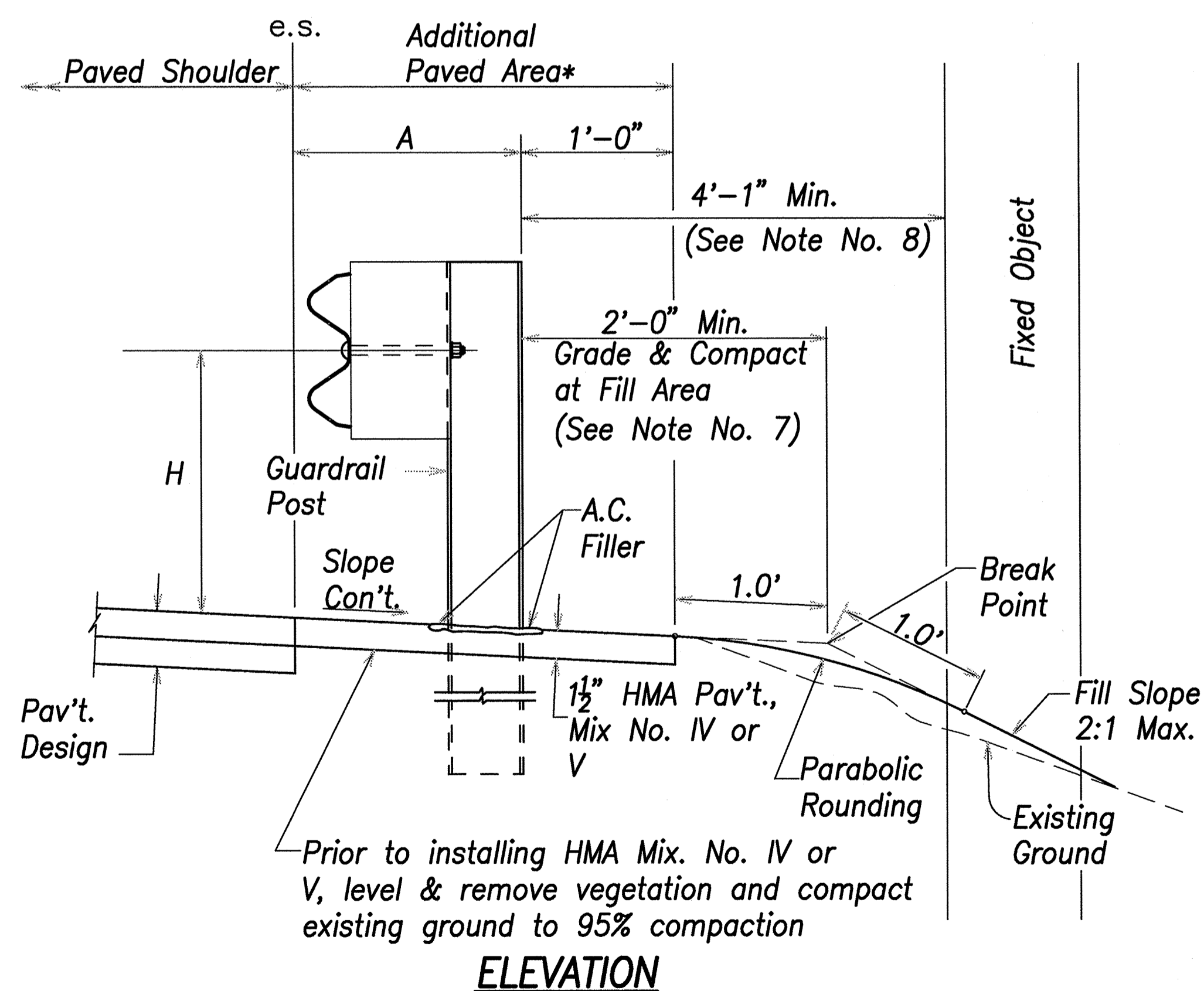
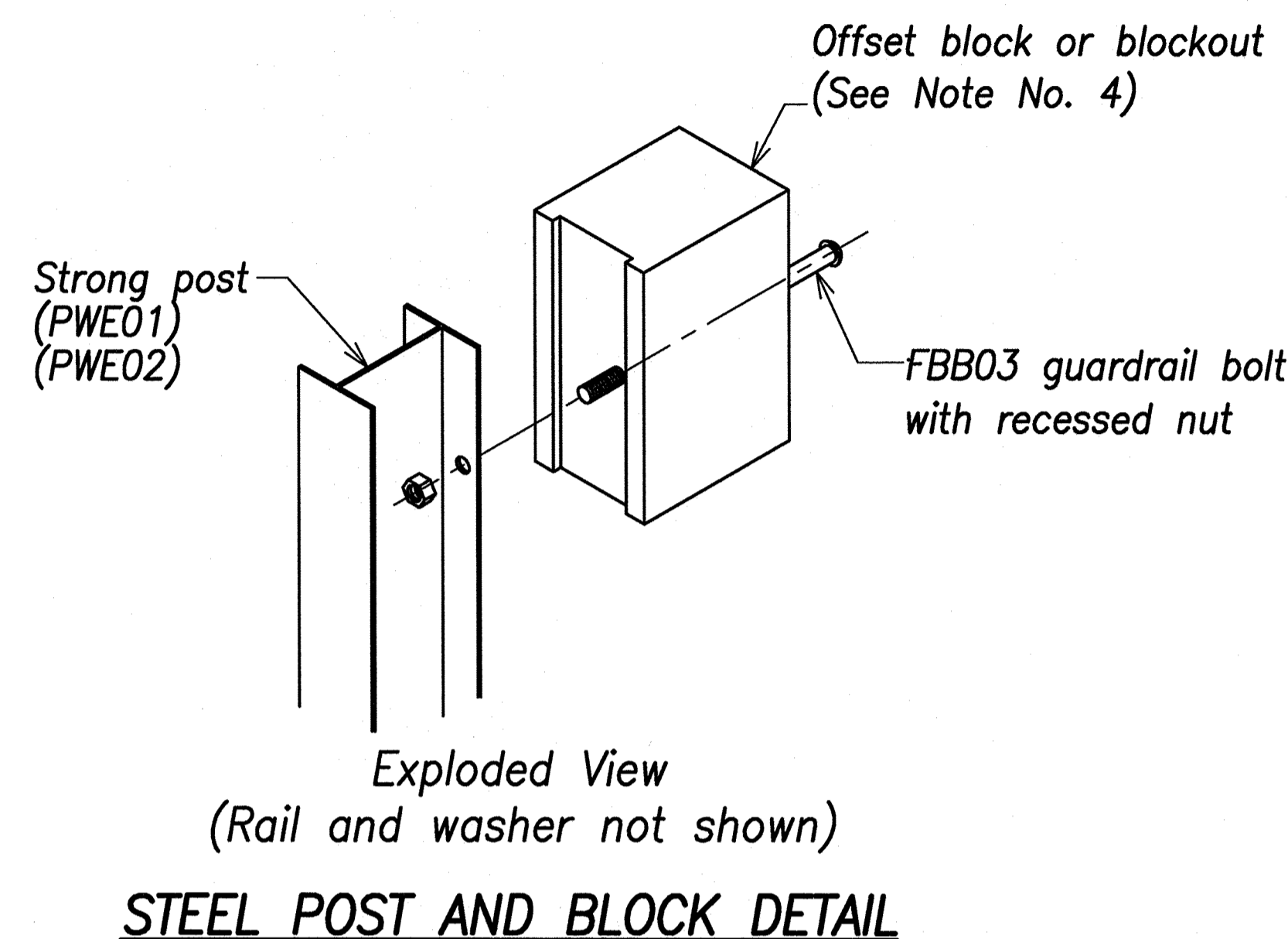
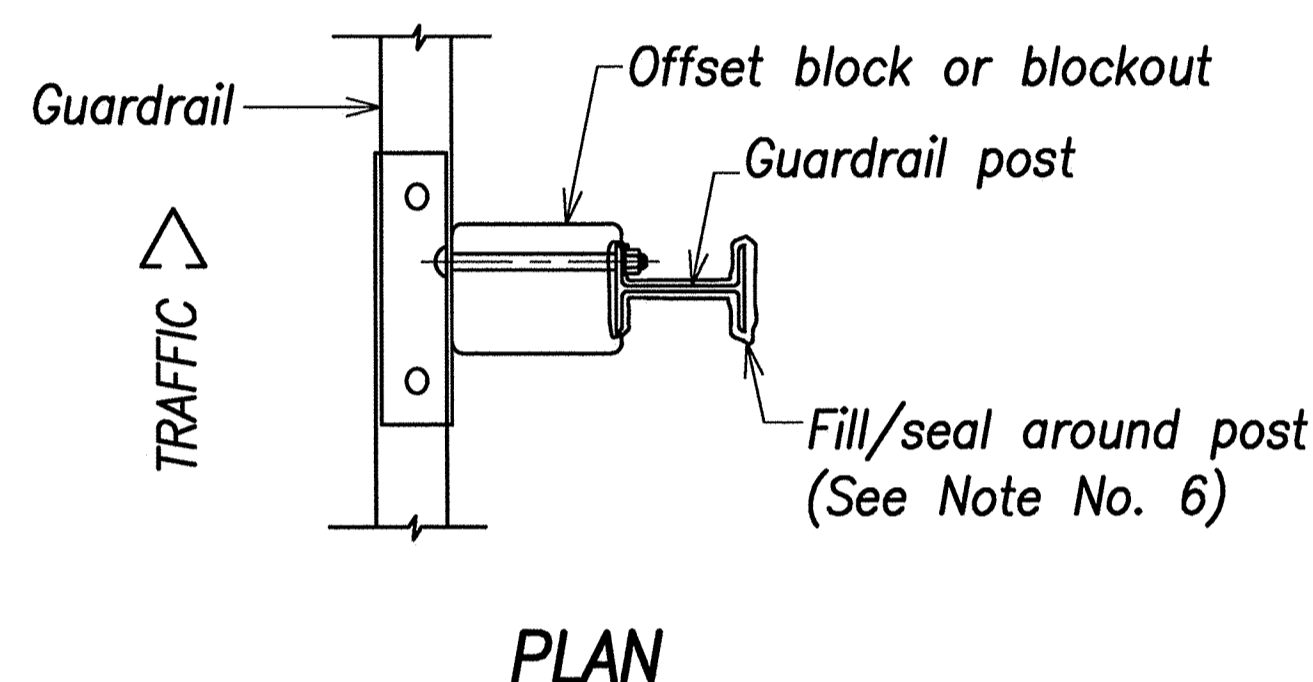
Scale: As Noted Date: February 2021

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|---------------------|-------|--------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 46 | 161 |

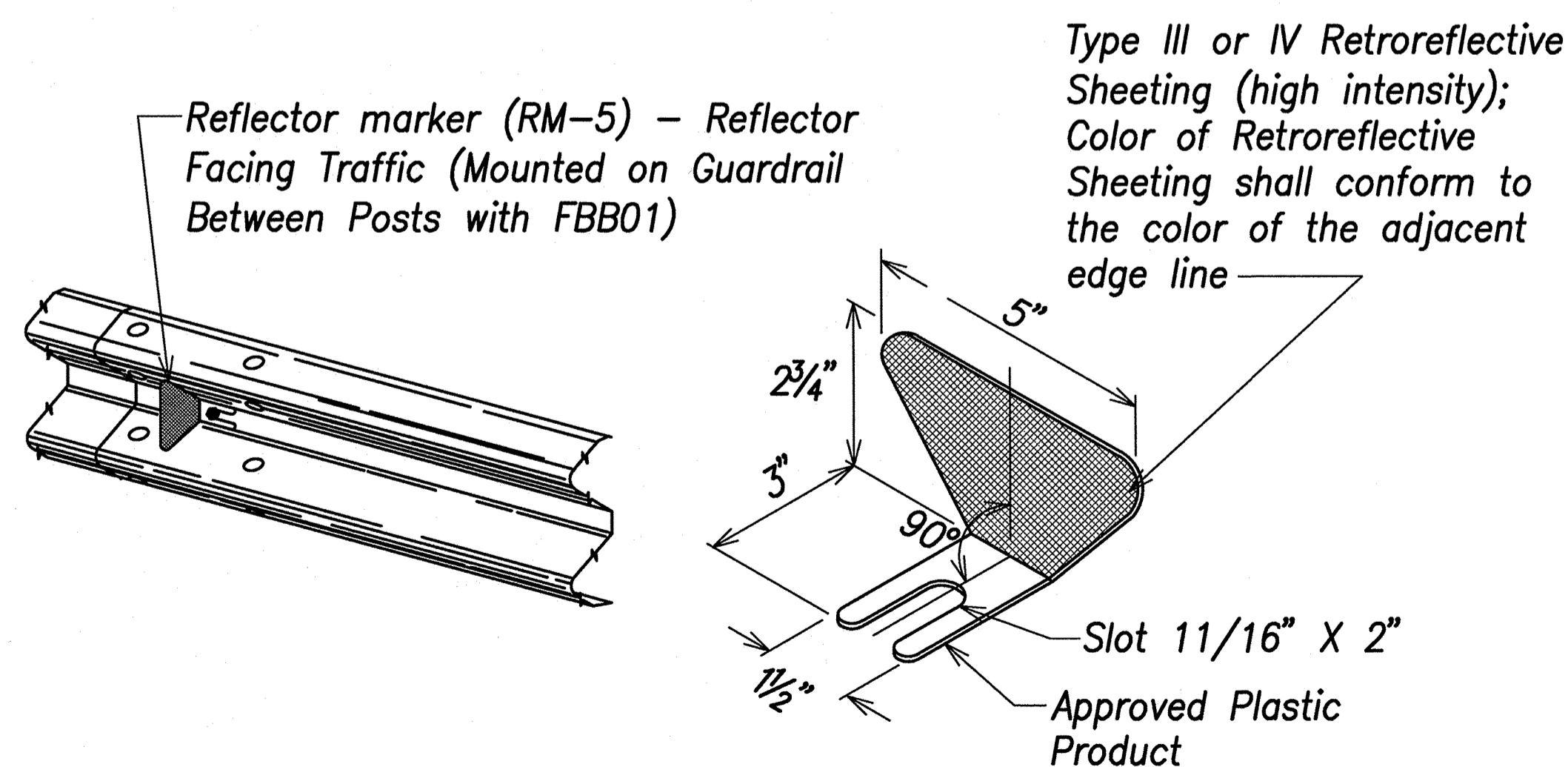
GENERAL NOTES

1. All hardware, posts and fasteners shall be hot-dip zinc coated galvanized after fabrication. No punching, drilling or cutting will be permitted after galvanizing.
2. Where conditions require, special post lengths in increments of 6 inches may be specified by the Engineer.
3. All fasteners, posts, and rail elements (i.e. FBB03, PWE01, RWM04b, etc.) shall conform to the latest edition and amendments of "A Guide to Standardized Highway Barrier Rail Hardware", a report prepared and approved by the AASHTO-AGC-ARTBA Joint Cooperative Committee, Subcommittee On New Highway Materials, Task Force 13 Report. Dimensions of fasteners, posts and rail elements have been converted from metric units into their present form.
4. The Blockout or Offset Block shall be approved by the State.
5. All new guardrail systems (system consists of total length of guardrail including both end treatments) shall include the Additional Paved Area.
6. After the guardrail posts are installed in the paved area, the Contractor shall fill/seal around each guardrail post and all cracks in the paved area caused during the guardrail post installation. If required by the inspector/engineer, the Contractor shall tamper the paved area around the guardrail post prior to filling/sealing. All costs associated with this work shall not be paid for separately, but shall be considered incidental to the various guardrail items.
7. When standards for the fill slope area cannot be met, a site specific, engineer approved design may be used.
8. Minimum working width (clear distance) between back of MGS post to any fixed object is 4'-1" (49").
9. New Hot Mix Asphalt (HMA) pavement at guardrails shall extend 6 feet longitudinally beyond terminal ends.
10. Reflector Markers (RM-5) mounted on guardrails shall be spaced every 25 feet. RM-5's shall not be installed on Terminal Sections. Furnishing and installing of each RM-5 shall be considered incidental to the guardrail system.

| GUARDRAIL TYPE | DIMENSION | |
|---------------------------------|-----------|--------|
| | H | A |
| MGS w/ Standard 8" Offset Block | 2'-1" | 1'-6" |
| MGS w/ No Blockout | 2'-7/8" | 9 1/4" |



TYPICAL GUARDRAIL INSTALLATION



REFLECTOR MARKER (RM-5) DETAIL AND TYPICAL INSTALLATION

| | |
|-------------|------|
| DESIGNED BY | DATE |
| DRAWN BY | |
| CHECKED BY | |
| IN CHARGE | |
| NOTED BY | |
| DATE | |

Walter G. C. O'Driscoll
4/30/22
R. M. TOWELL CORPORATION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

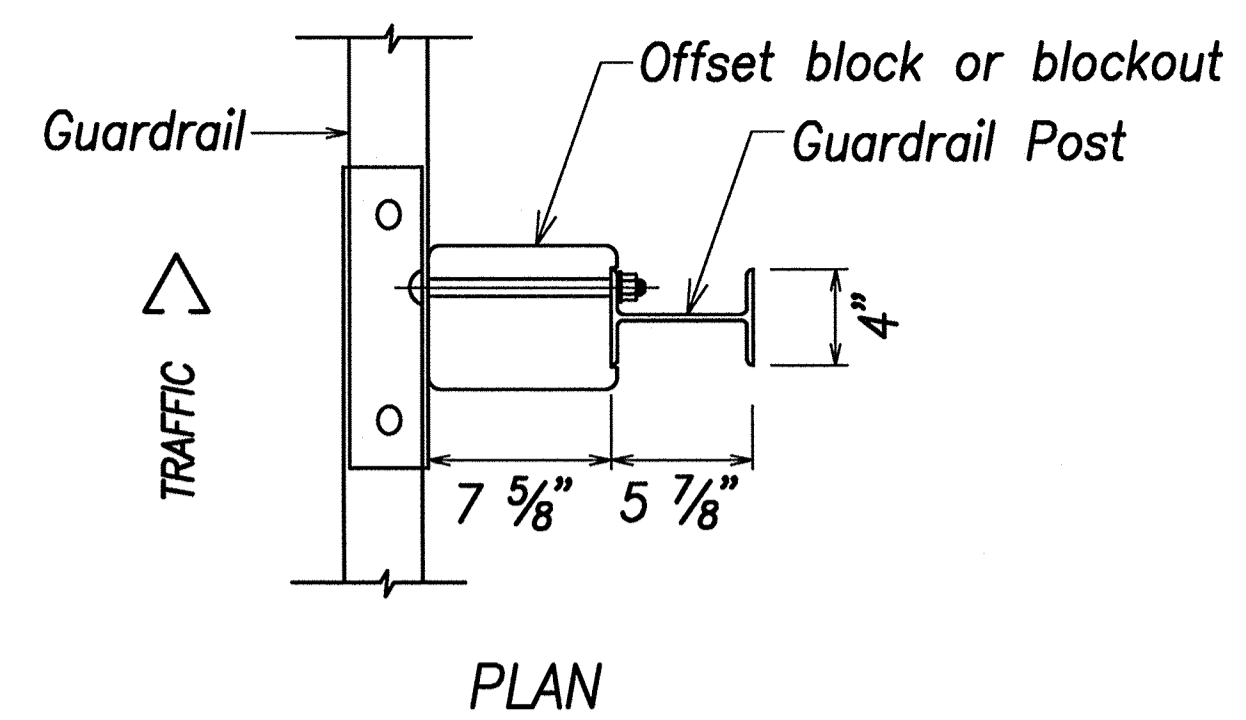
GUARDRAIL DETAILS & NOTES

*Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)*

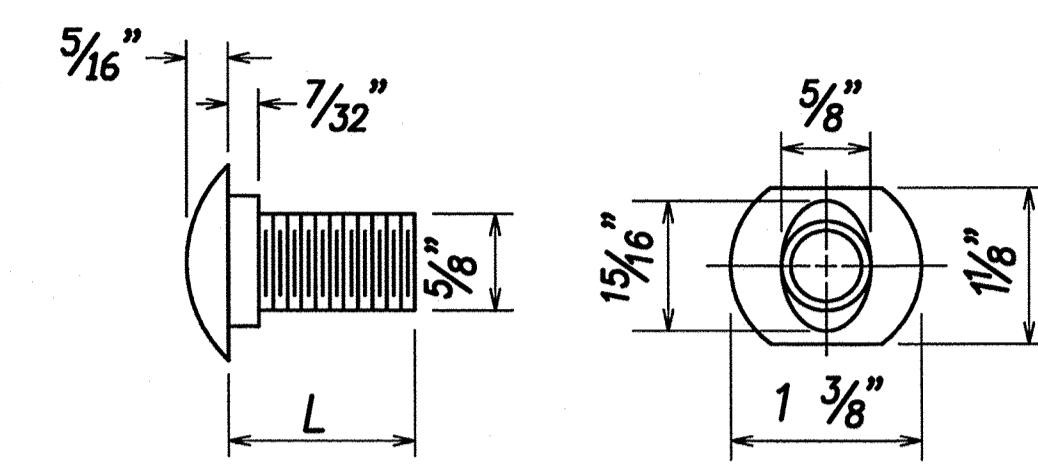
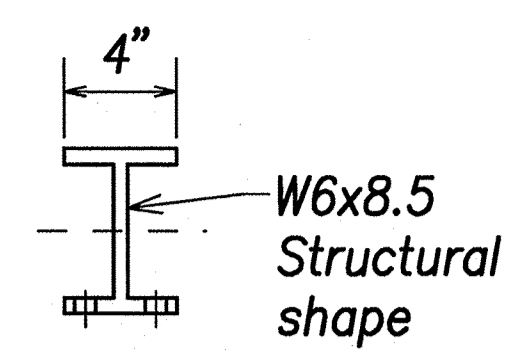
Scale: As Noted Date: February 2021

SHEET No. C-44 OF SHEETS

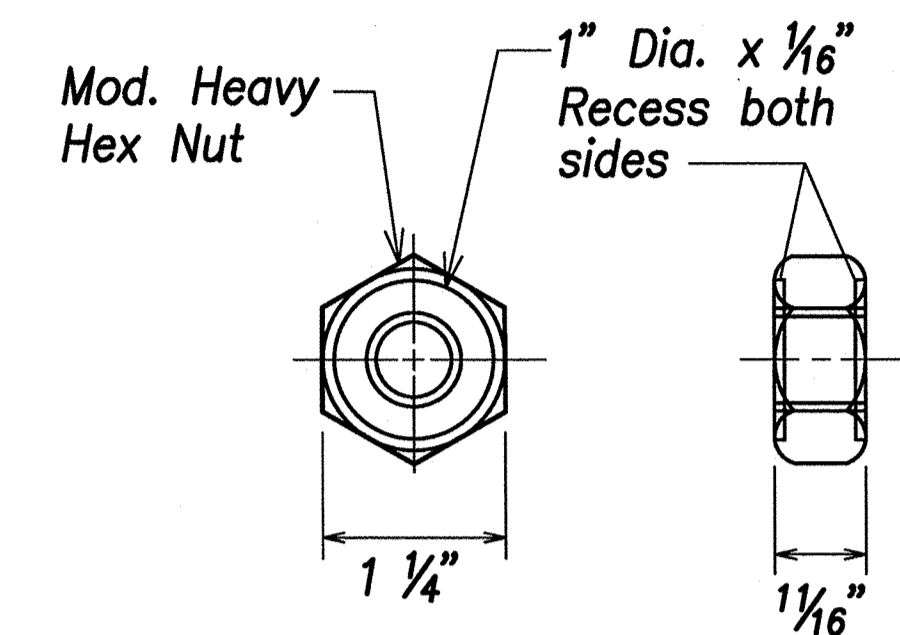
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|---------------------|-------|--------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 47 | 161 |



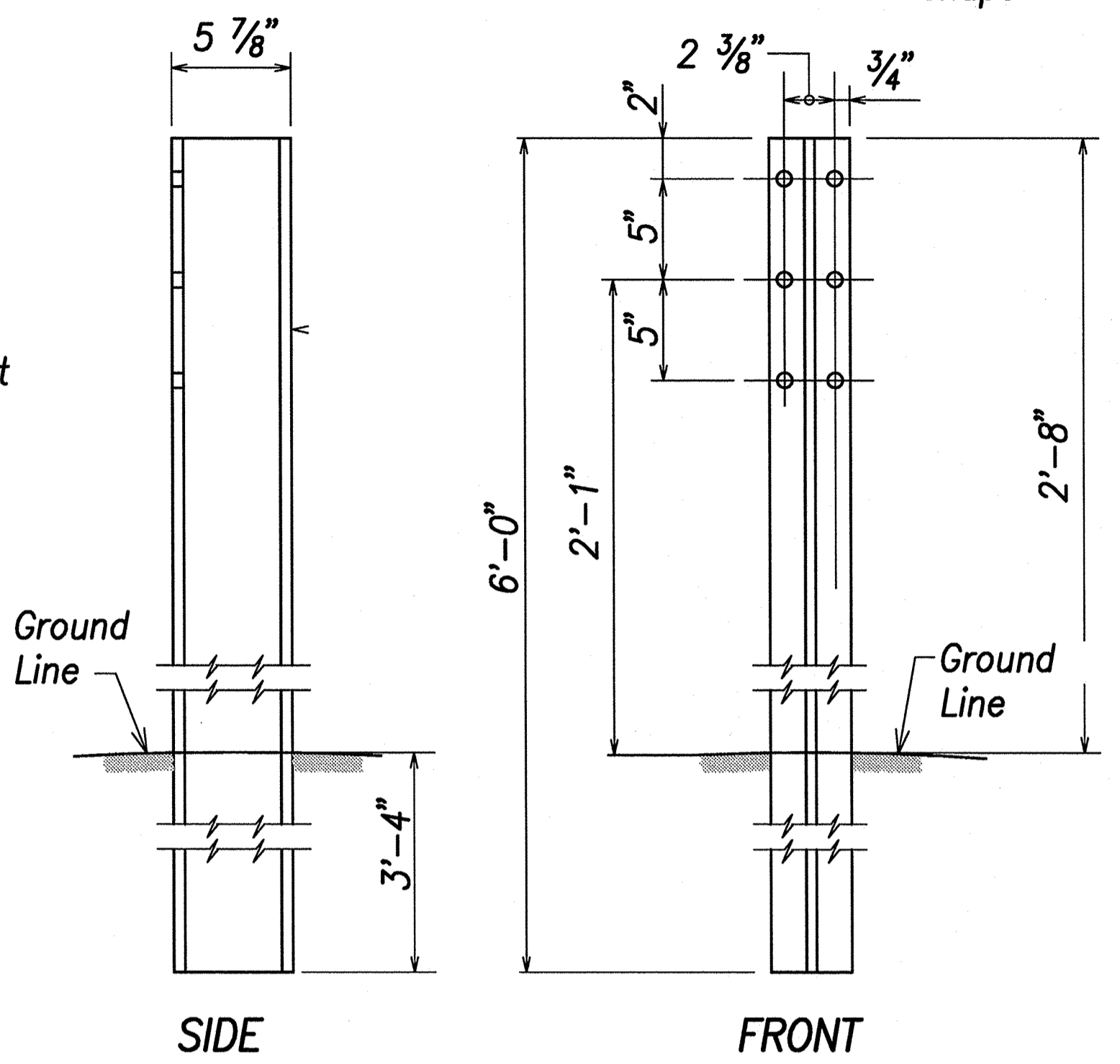
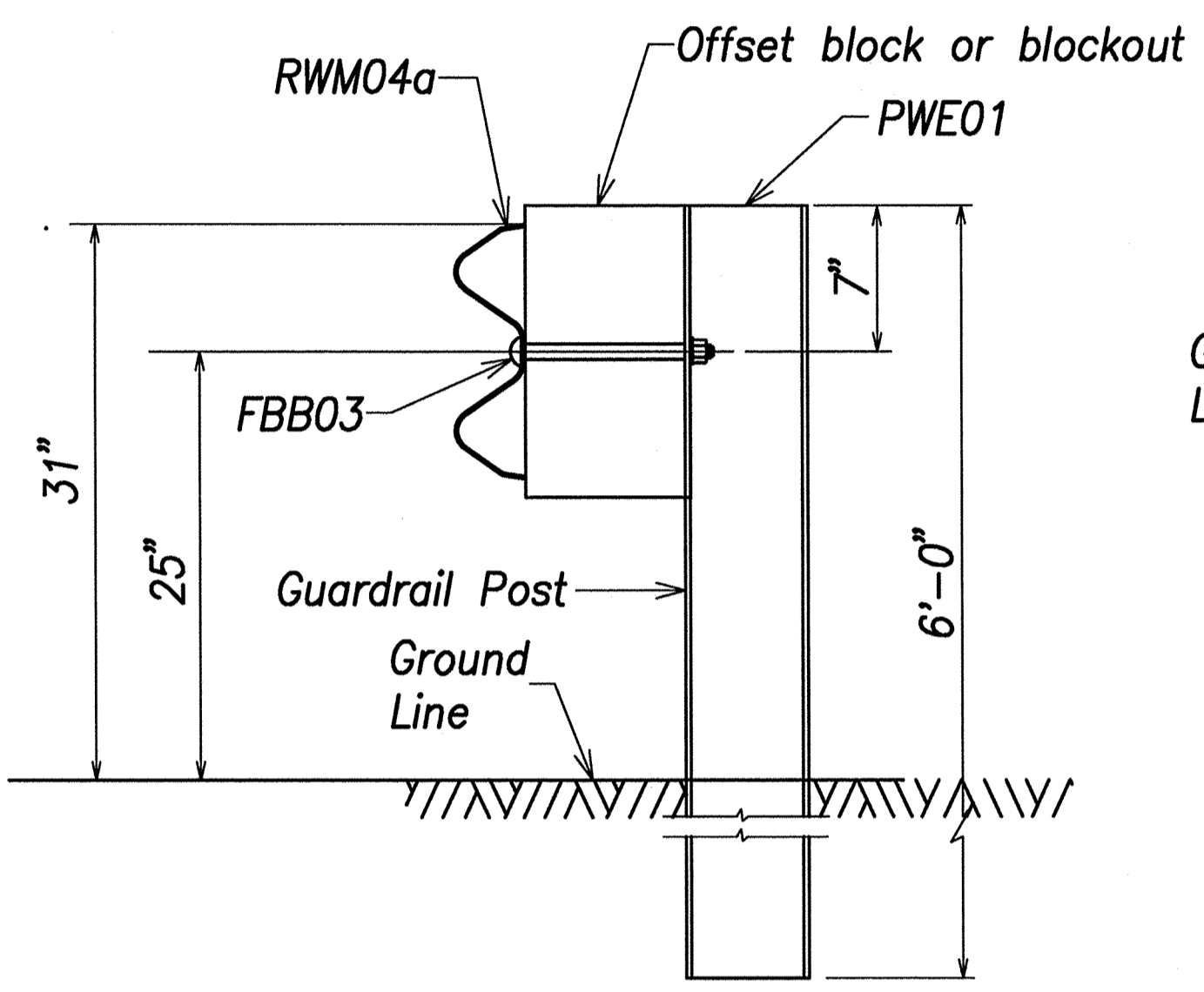
NOTE:
All Holes are 3/4" Dia.



| DESIGNATOR | L |
|------------|--------|
| FBB01 | 1 3/8" |
| FBB02 | 2" |
| FBB03 | 10" |

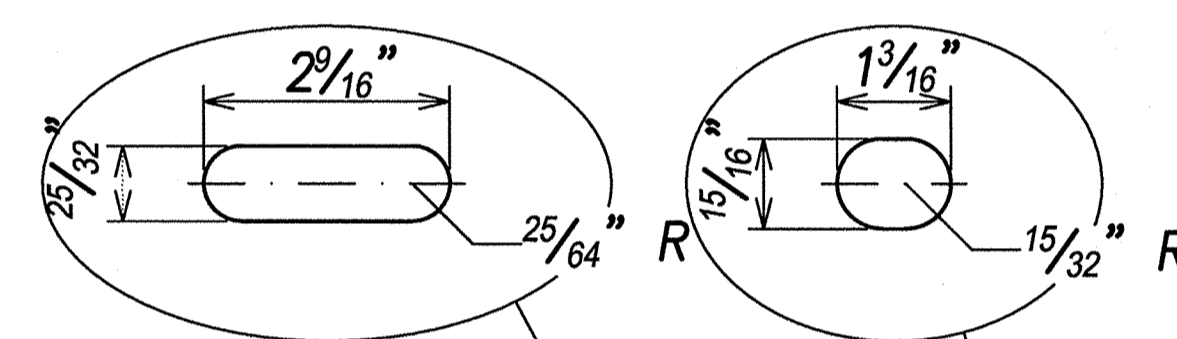


GUARDRAIL BOLTS AND RECESSED NUT

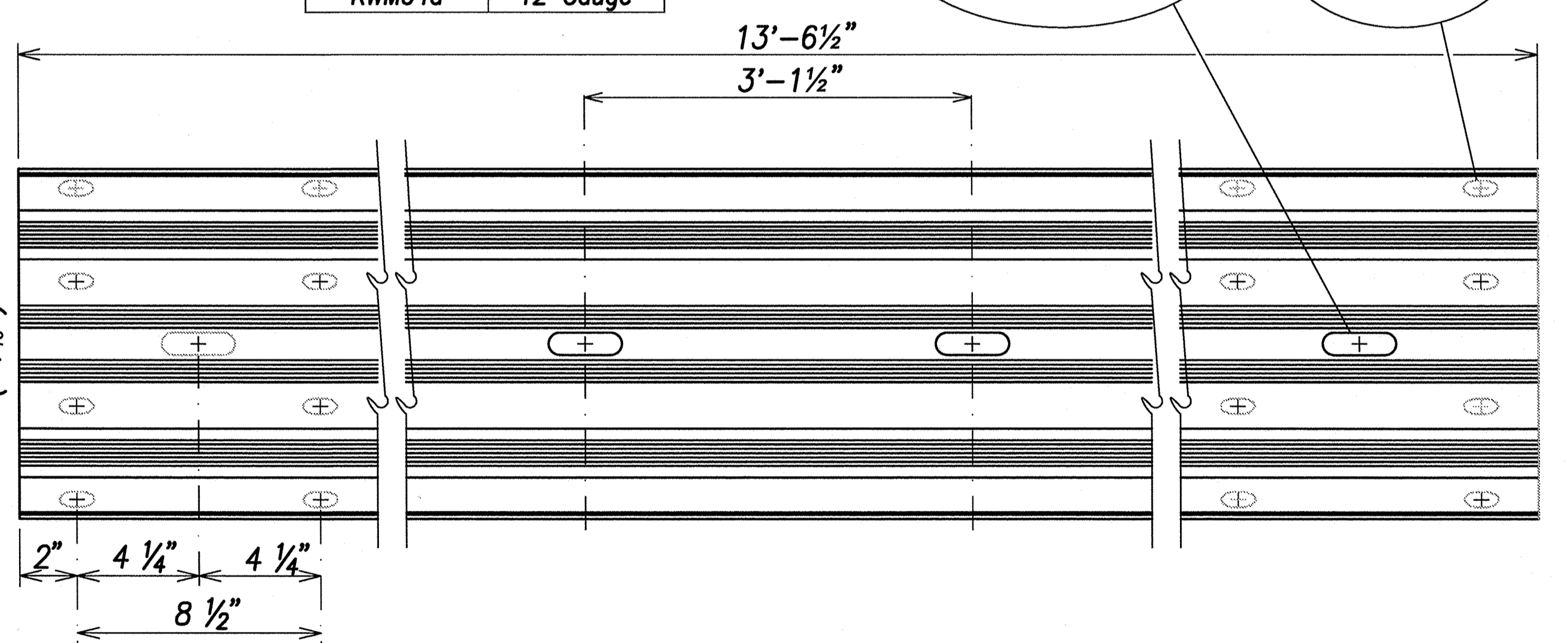
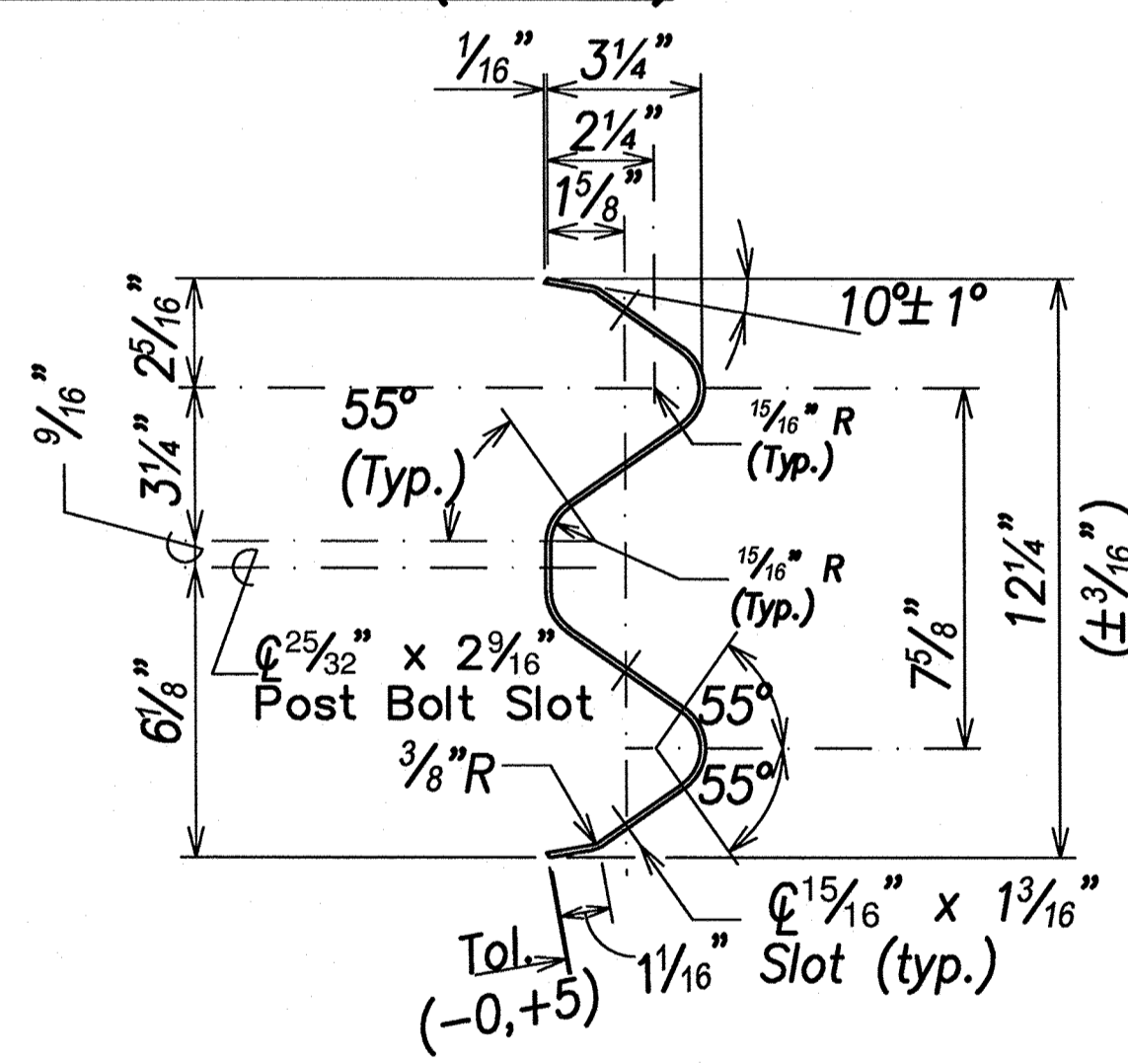


WIDE-FLANGED GUARDRAIL POST (PWE01)

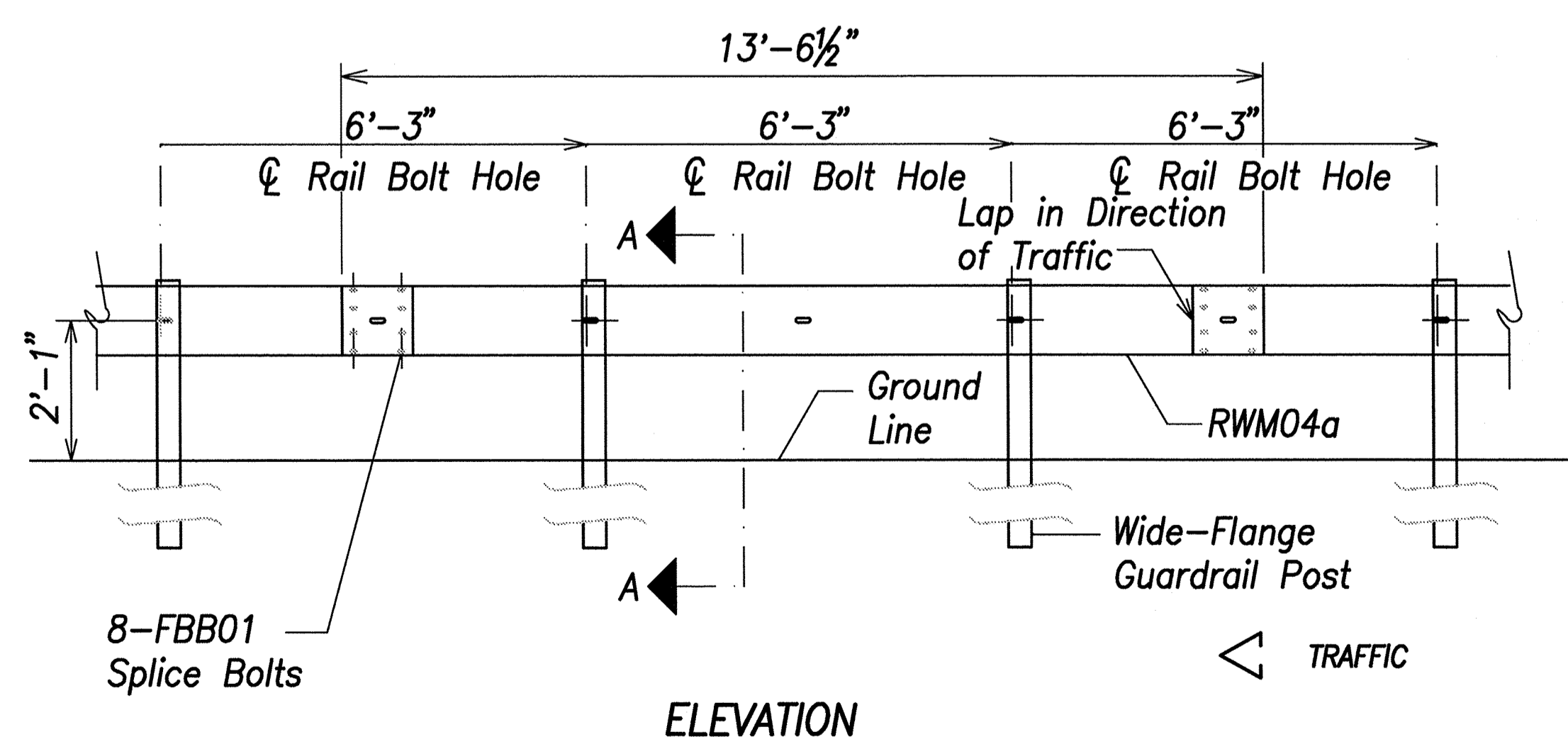
| Designator | Base Metal Thickness |
|------------|----------------------|
| RWM04a | 12 Gauge |



ELEVATION SECTION A-A



4 SPACE W-BEAM GUARDRAIL (RWM04a)



MIDWEST GUARDRAIL SYSTEM WITH STANDARD 8" OFFSET BLOCK (SGR47)

| | |
|-------------|------|
| DESIGNED BY | DATE |
| DRAWN BY | |
| CHECKED BY | |
| IN CHARGE | |
| NO. | |

WALTER G. C. CHONG
LICENSED PROFESSIONAL ENGINEERS
No. 8362-C
HAWAII, U.S.A.

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Walter G. C. Chong 4/30/22
SIGNATURE LIC. EXPIRATION
R. M. TOWILL CORPORATION

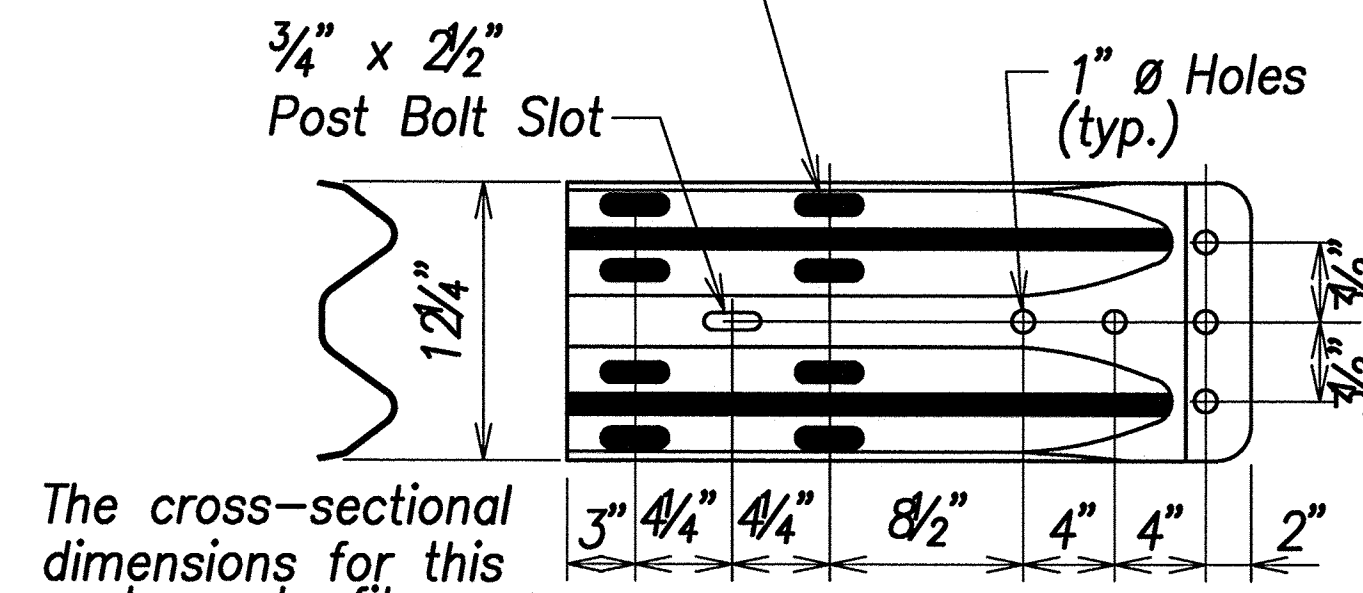
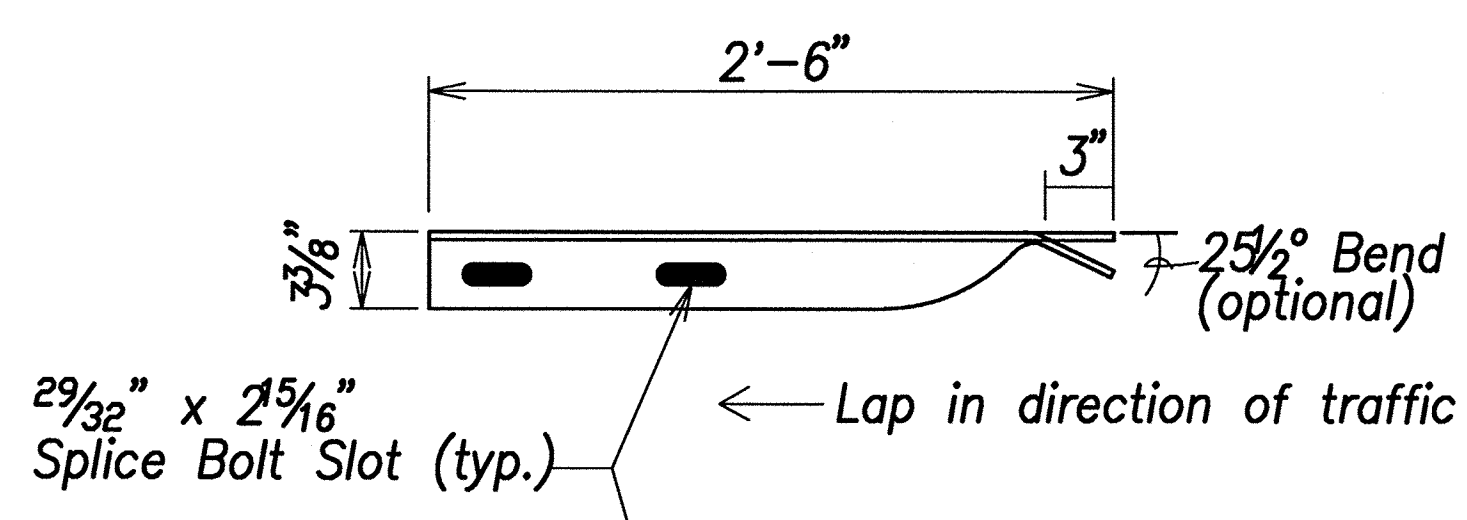
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

31" W-BEAM WITH STANDARD 8" OFFSET BLOCK

*Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)*

Scale: As Noted Date: February 2021

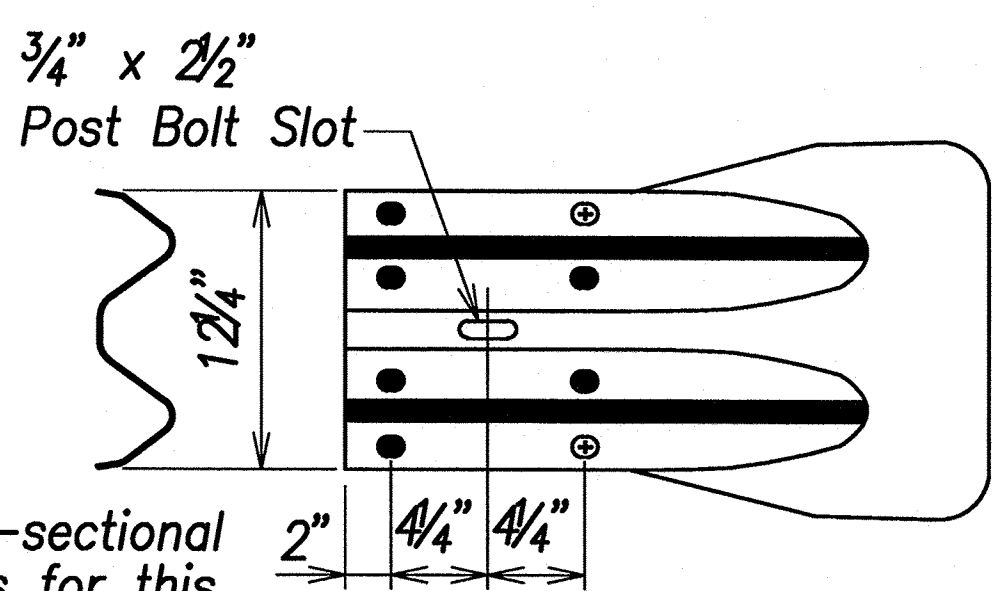
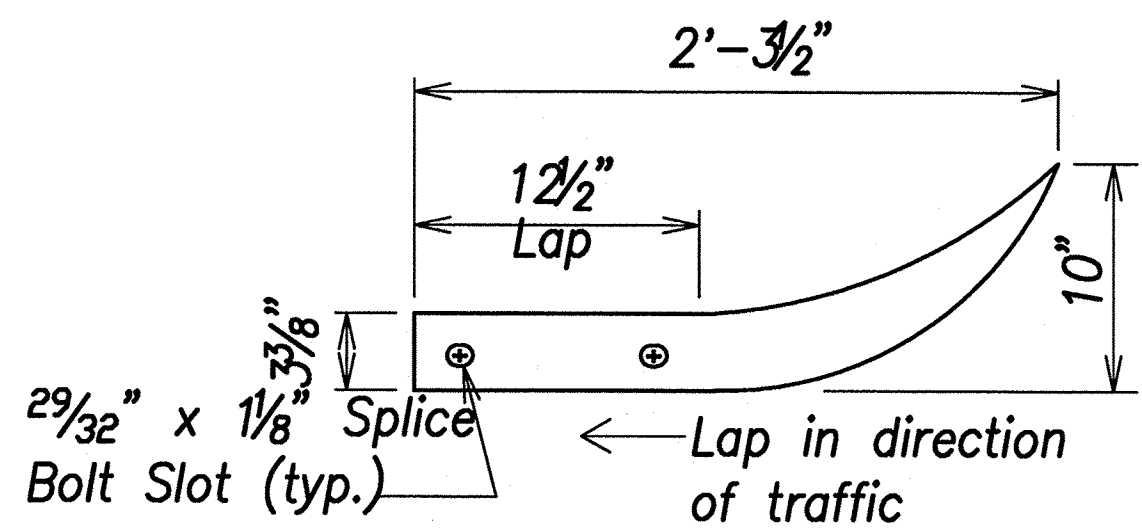
| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 48 | 161 |



The cross-sectional dimensions for this part are to fit over part RWM02a on the approach end and under part RWM02a on the trailing end.

| Designator | Base Metal Thickness |
|------------|----------------------|
| RWE02b | 10 Gauge |

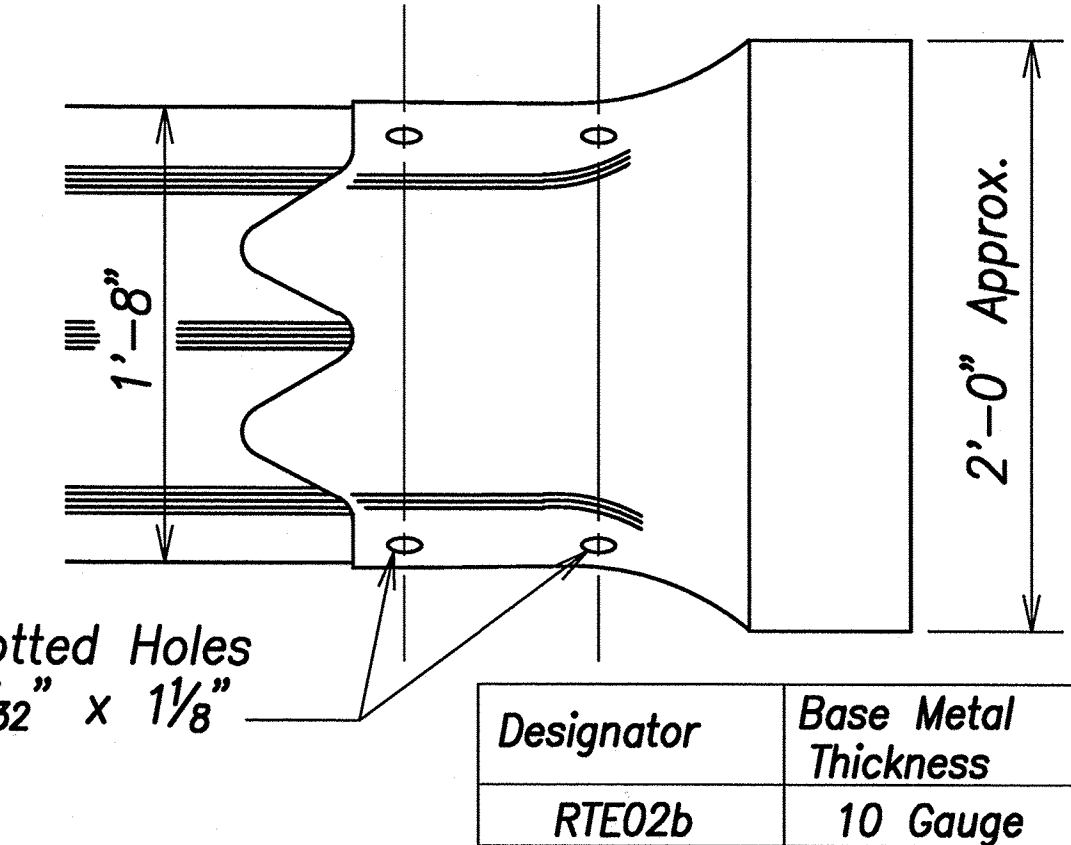
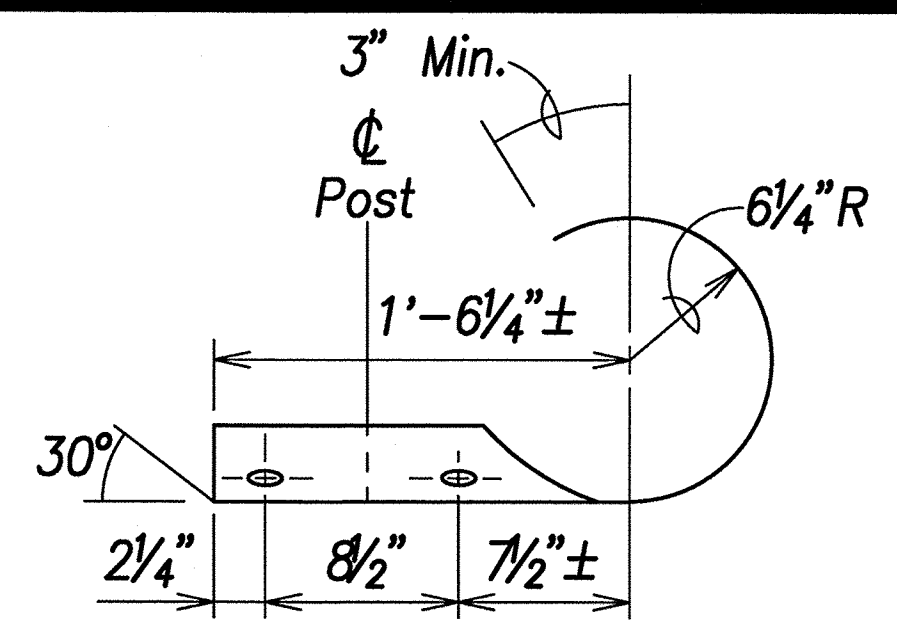
W-BEAM TERMINAL CONNECTOR (RWE02b)



The cross-sectional dimensions for this part are to fit over part RWM02a on the approach end and under part RWM02a on the trailing end.

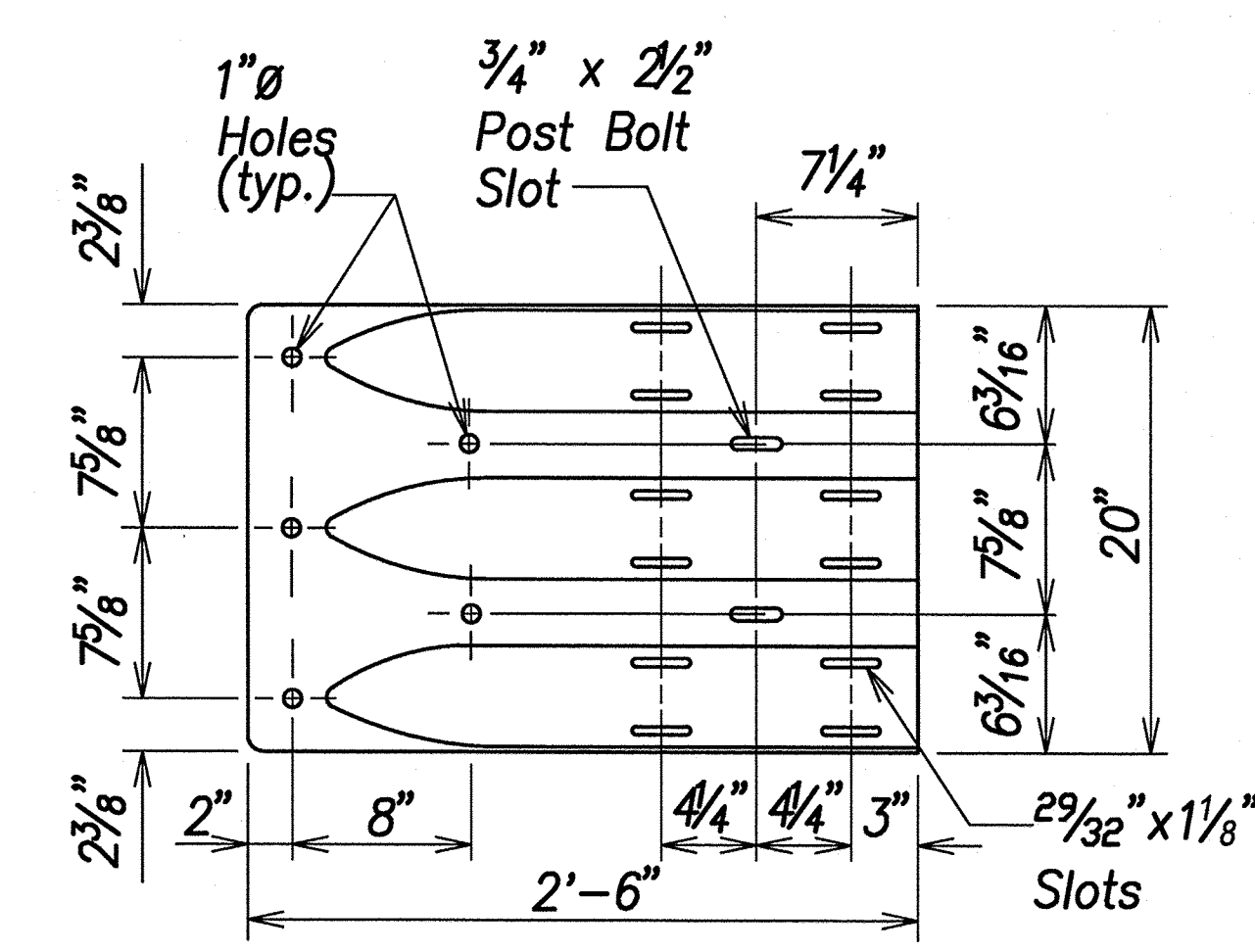
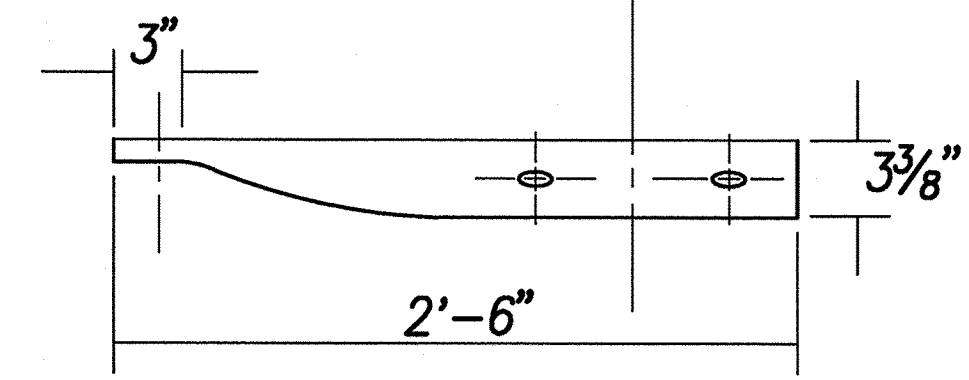
| Designator | Base Metal Thickness |
|------------|----------------------|
| RWE01a | 12 Gauge |

W-BEAM END SECTION (FLARED RWE01a)



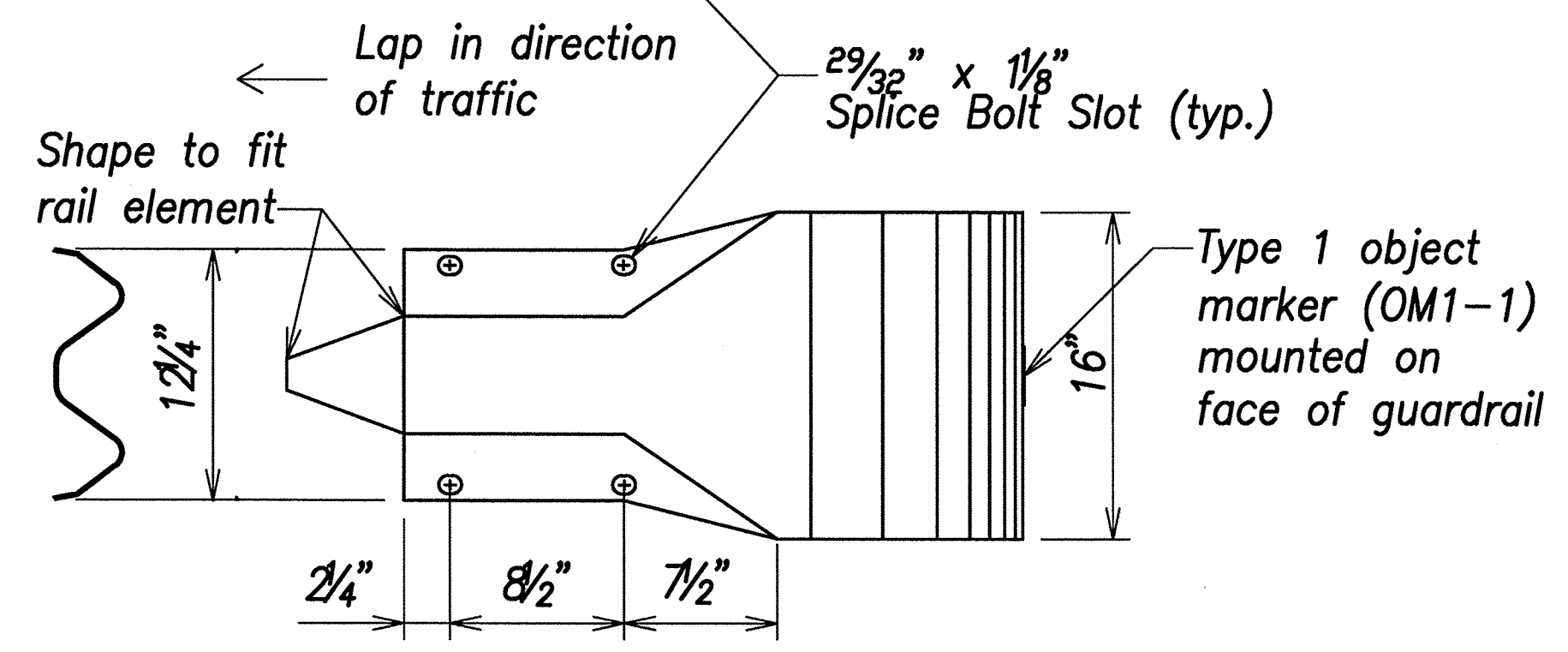
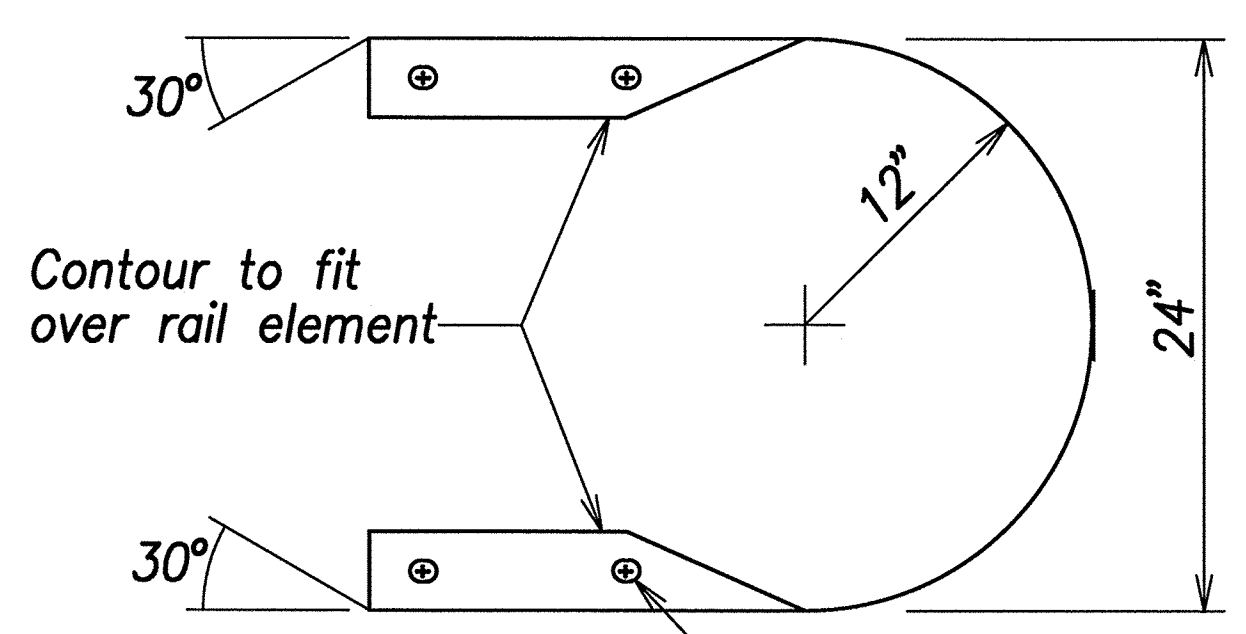
| Designator | Base Metal Thickness |
|------------|----------------------|
| RTE02b | 10 Gauge |

THRIE-BEAM SECTION (ROUNDED) (RTE02b)



| Designator | Base Metal Thickness |
|------------|----------------------|
| RTE01b | 10 Gauge |

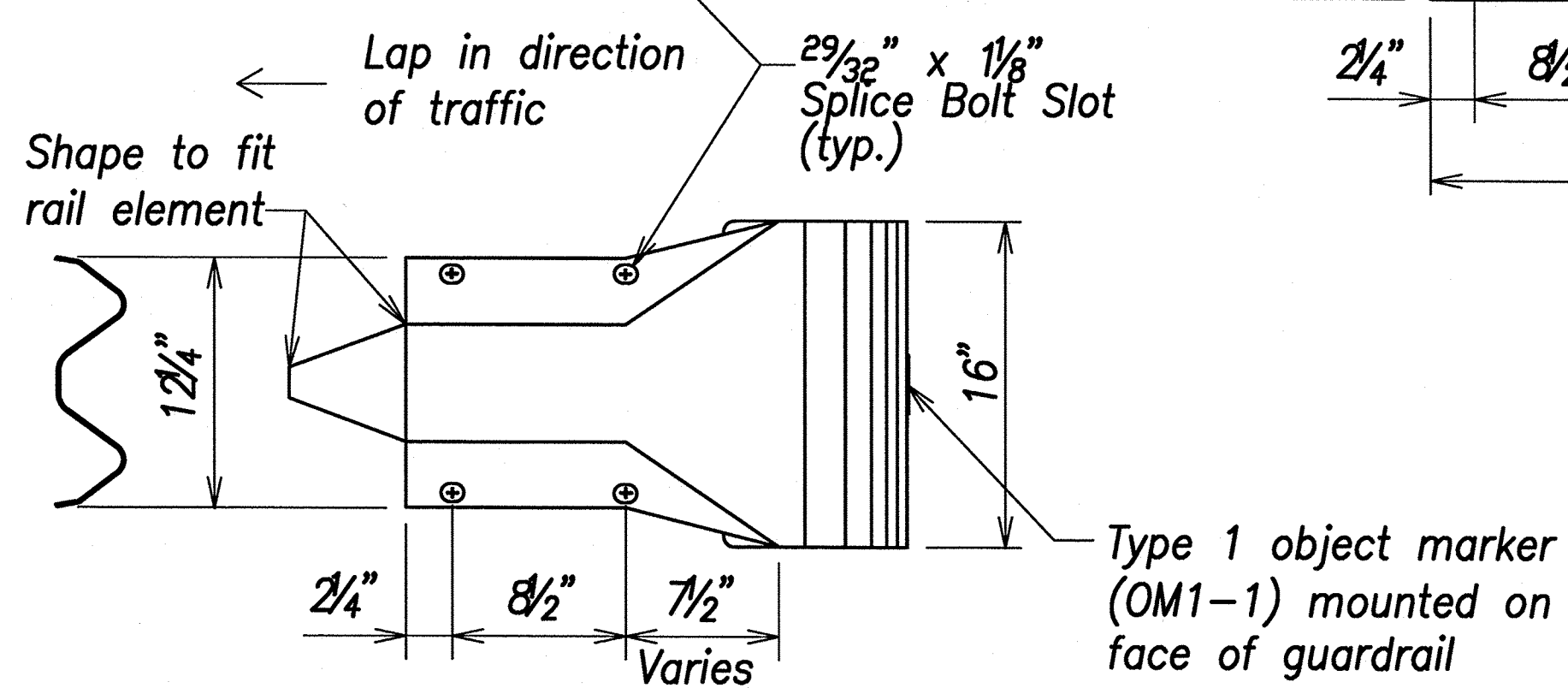
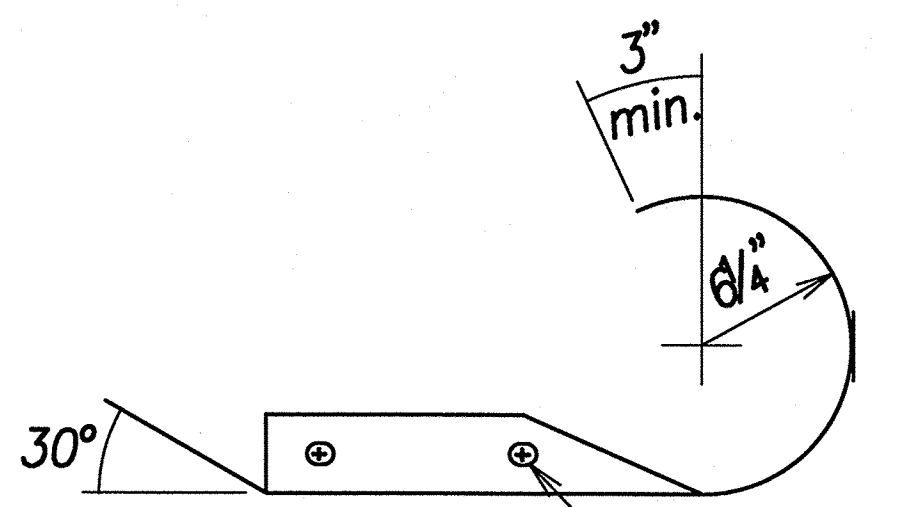
THRIE-BEAM TERMINAL CONNECTOR (RTE01b)



The cross-sectional dimensions for this part are to fit over part RWM02a

| Designator | Base Metal Thickness |
|------------|----------------------|
| RWE06a | 12 Gauge |

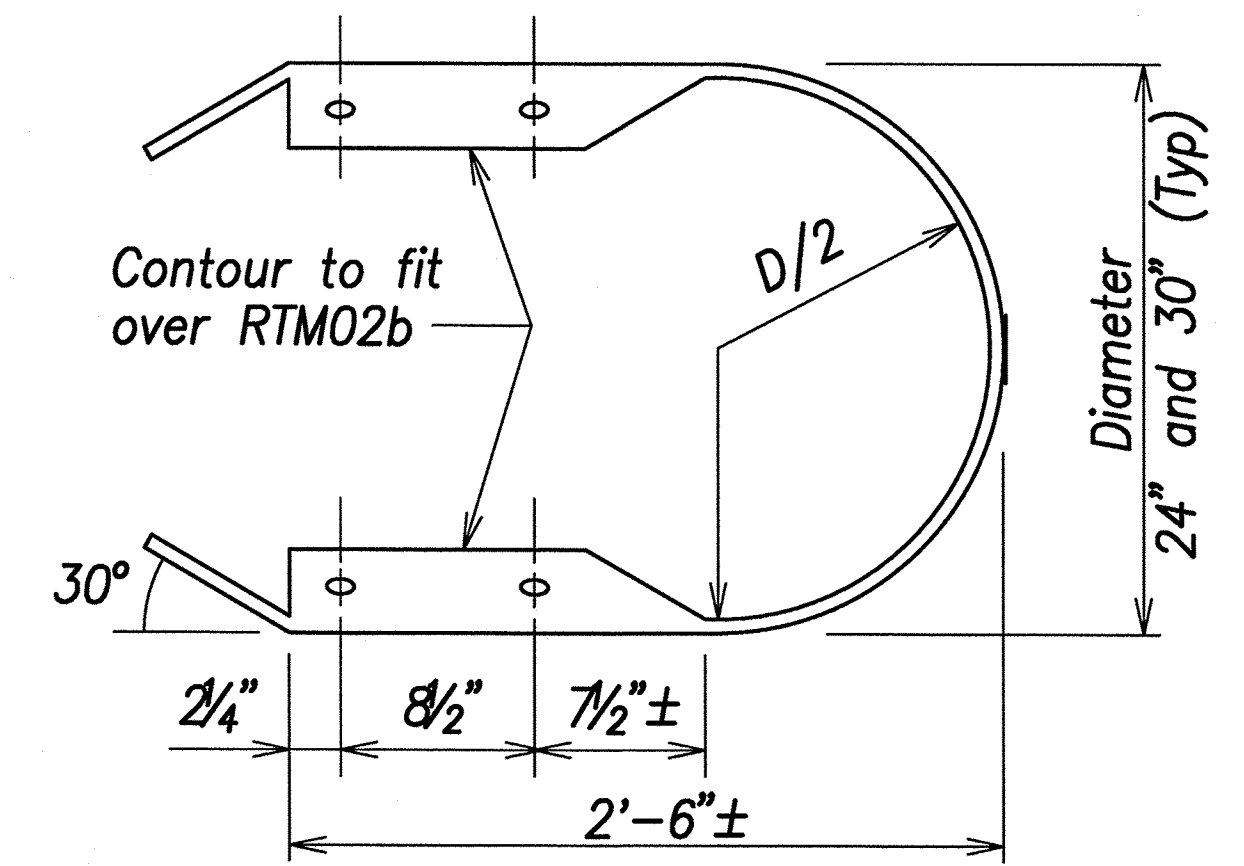
W-BEAM END SECTION (BUFFER RWE06a)



The cross-sectional dimensions for this part are to fit over part RWM02a

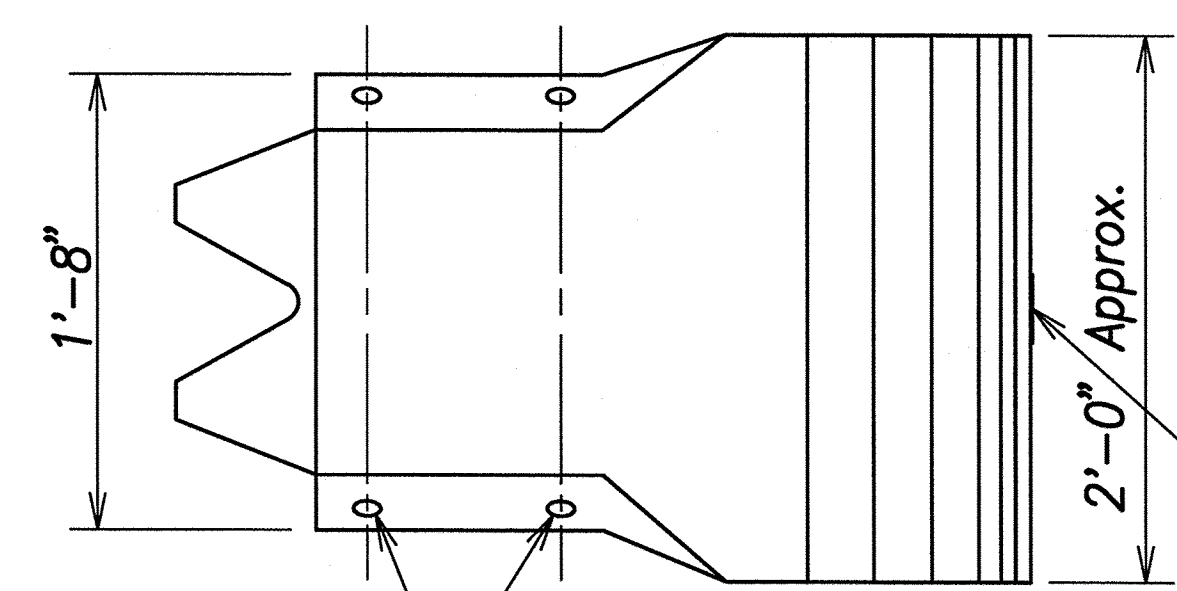
| Designator | Base Metal Thickness |
|------------|----------------------|
| RWE03a | 12 Gauge |

W-BEAM END SECTION (ROUNDED RWE03a)



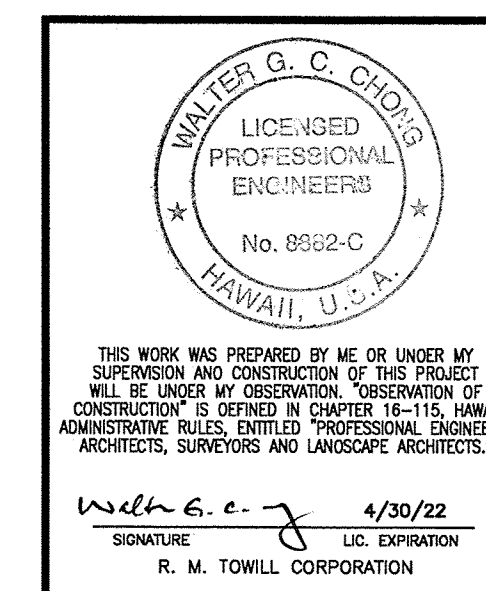
| Designator | Base Metal Thickness |
|-----------------|----------------------|
| RTE03b & RTE04b | 10 Gauge |

THRIE-BEAM END SECTION (BUFFER RTE03b OR RTE04b)



Slotted Holes 29/32 x 1/8
Type 1 object marker (OM1-1) mounted on face of guardrail

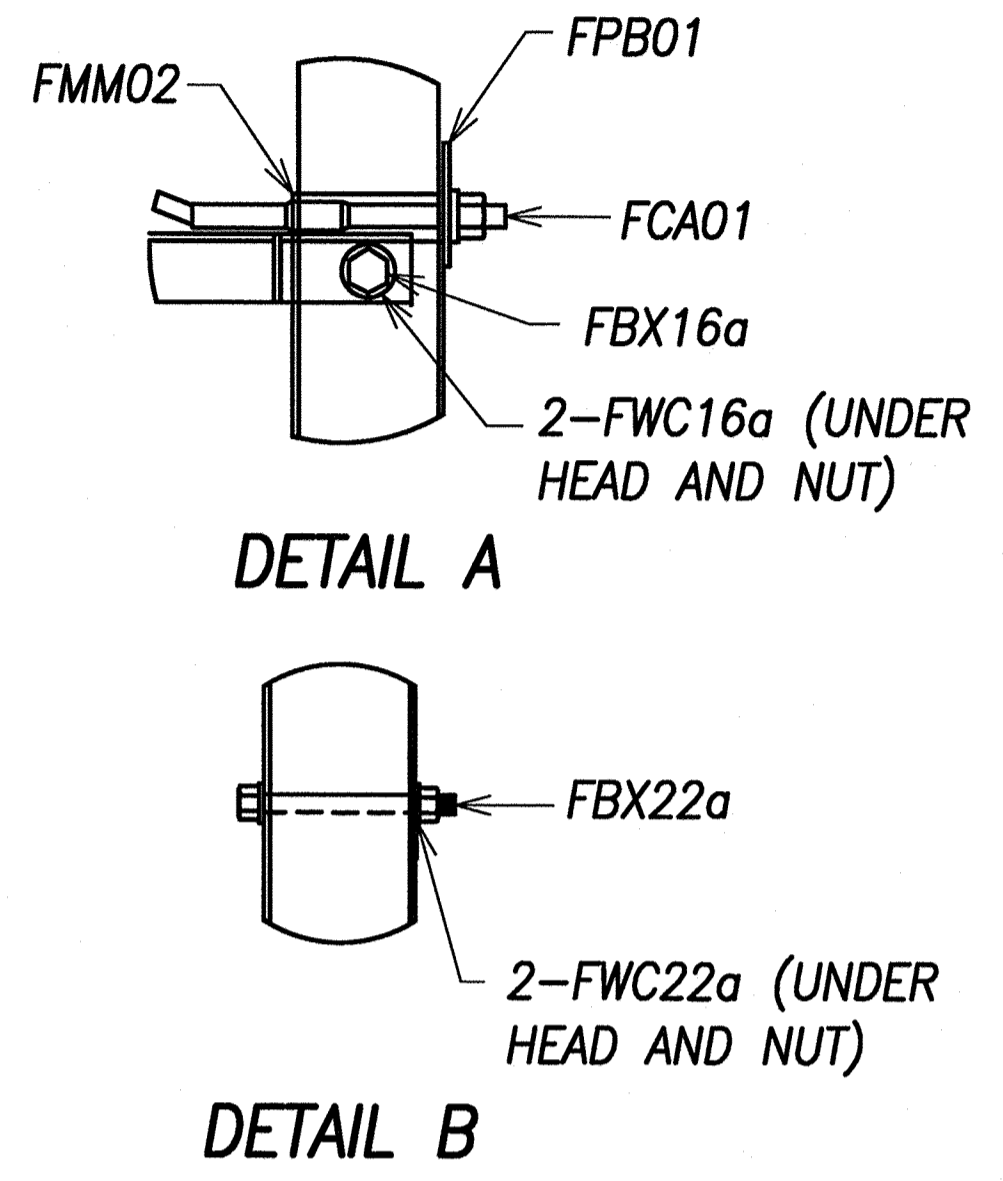
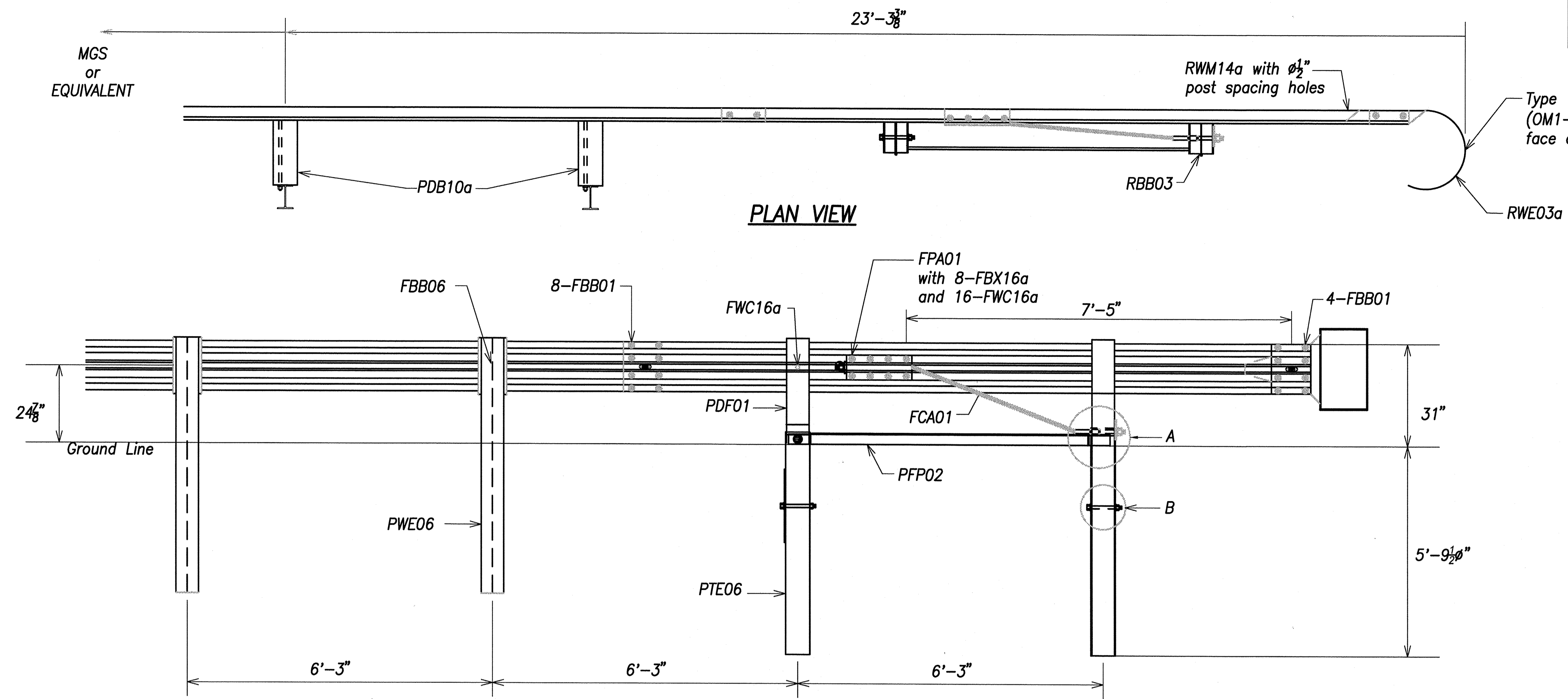
| | |
|-------------|-------|
| DATE | |
| DESIGNED BY | WC |
| DRAWN BY | WC |
| CHECKED BY | |
| APPROVED BY | |
| NO. | |



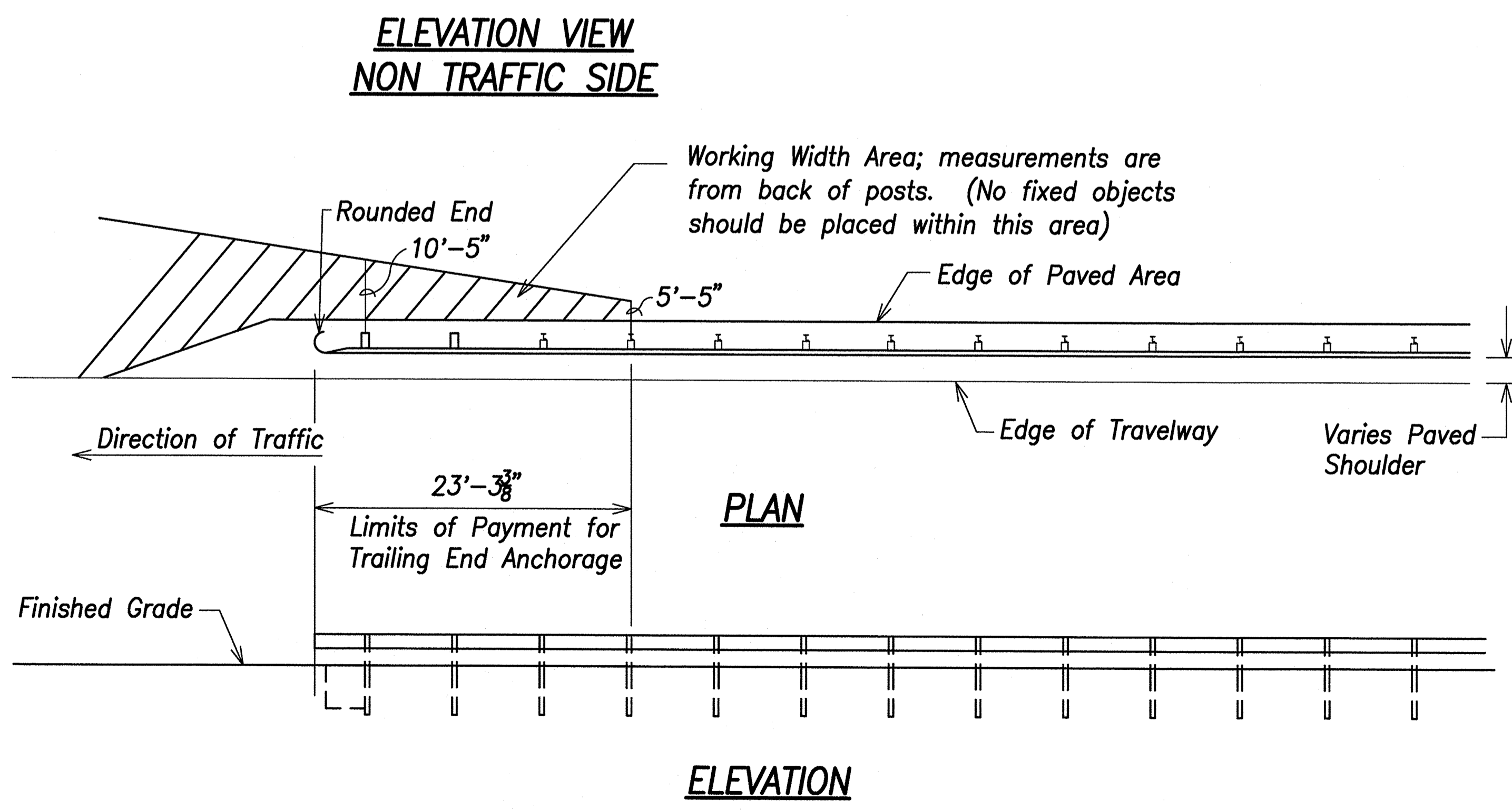
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
GUARDRAIL TERMINAL CONNECTORS AND END SECTIONS
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

Scale: As Noted Date: February 2021

| | | | | | |
|---------------------|-------|--------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 49 | 161 |



| ITEM NO. | QTY | COMPONENTS |
|----------|-----|--------------------------------|
| FBB01 | 12 | Guardrail Bolt and Nut |
| FBB03 | 2 | Guardrail Bolt and Nut |
| FBB06 | 1 | Guardrail Bolt and Nut |
| FBX16a | 2 | Hex Head Bolt (10") and Nut |
| FBX16a | 8 | Hex Head Bolt (1 1/2") and Nut |
| FBX22a | 2 | Hex Head Bolt (7 1/2") and Nut |
| FCA01 | 1 | BCT Anchor Cable Assembly |
| PDB10a | 2 | MGS Timber Blockout |
| PFP02 | 1 | Strut and Yoke Assembly |
| PWE06 | 1 | Wide-Flange Guardrail Post |
| FMM02 | 1 | BCT Post Sleeve |
| FPA01 | 1 | Anchor Bracket Assembly |
| FPB01 | 1 | BCT Bearing Plate |
| FWC16a | 22 | Circular Washer |
| FWC22a | 4 | Circular Washer |
| PDF01 | 2 | BCT Timber Post |
| PTE06 | 2 | Foundation Tube |
| RWE03a | 1 | W-Beam Rounded End Section |
| RWM14a | 1 | W-Beam MGS End Section |



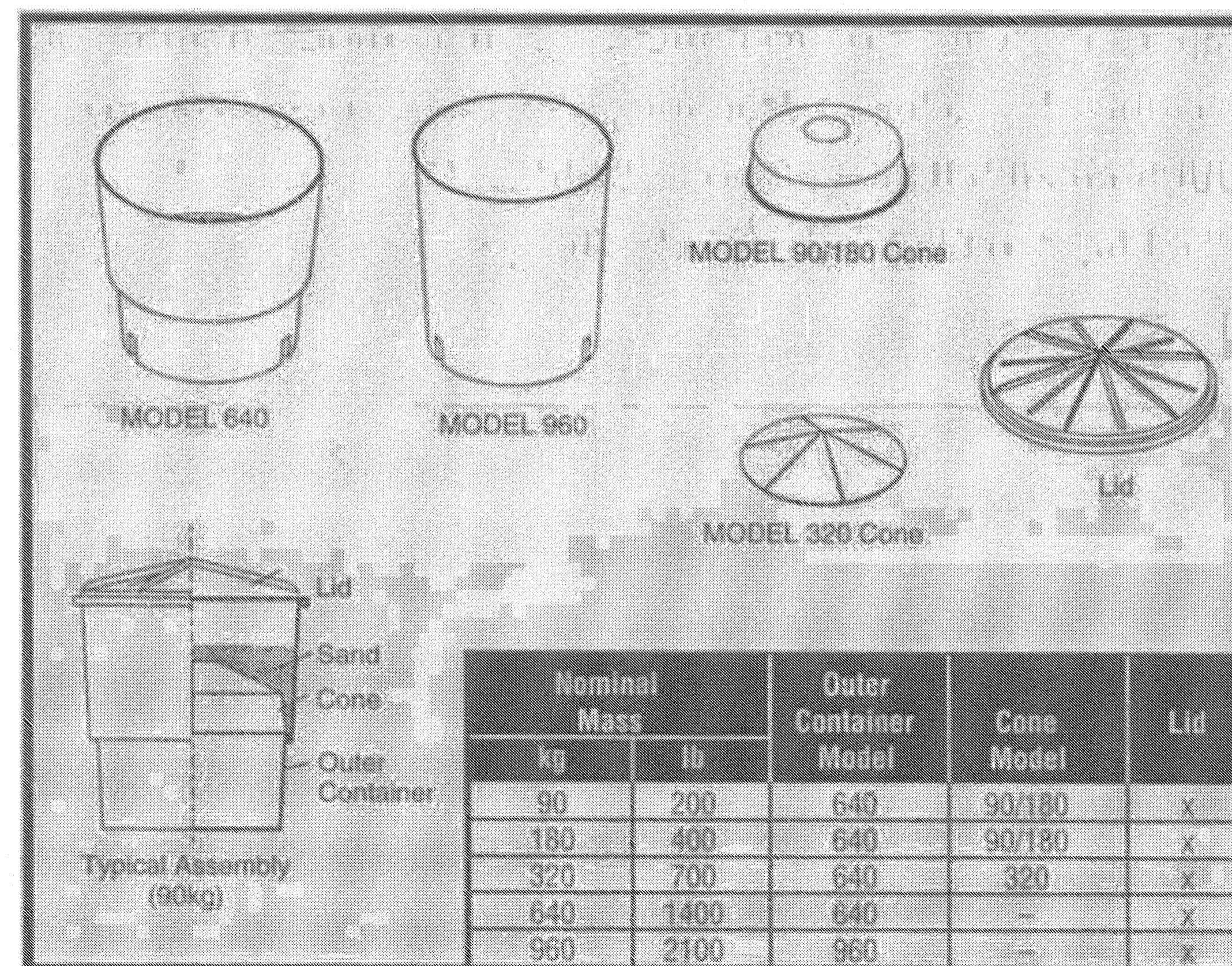
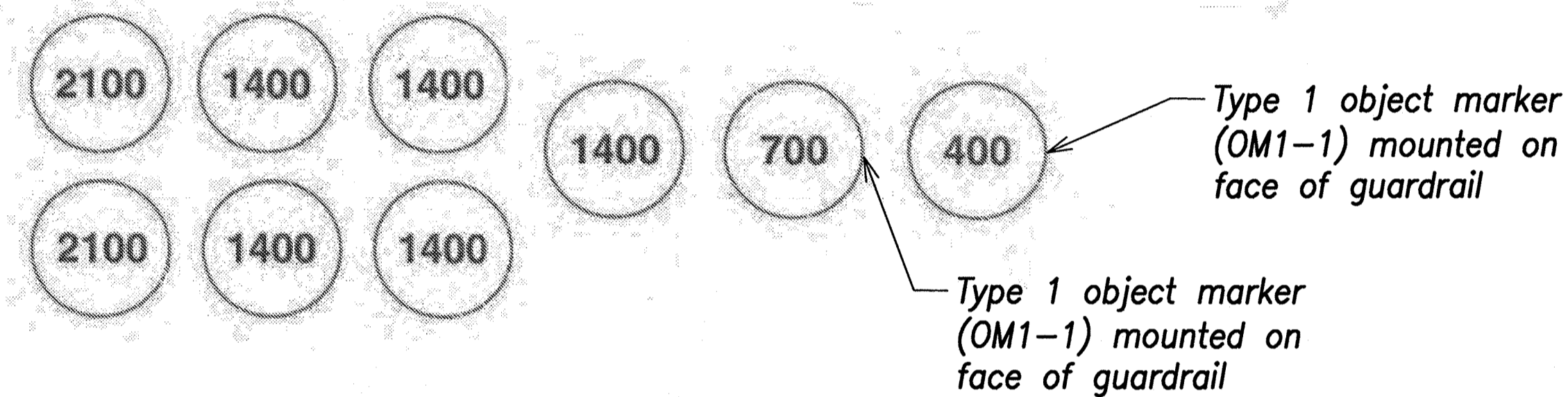
| | |
|---------------|----|
| DATE | BY |
| REVISION | BY |
| QUANTITIES BY | MC |
| CHECKED BY | |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
GUARDRAIL TRAILING END
ANCHORAGE DETAILS
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

Scale: As Noted
Date: February 2021

DESIGN VELOCITY 45 mph (72 km/h)

| ROW | SAND MASS (lbs) | 1800 lb vehicle | | | 4500 lb vehicle | | |
|-----|-----------------|-----------------|-----------------|--------------------|-----------------|-----------------|--------------------|
| | | EXIT VEL (mph) | AVE G'S FOR ROW | IMPULSE TIME (sec) | EXIT VEL (mph) | AVE G'S FOR ROW | IMPULSE TIME (sec) |
| 0 | | 45.0 | | | 45.0 | | |
| 1 | 400 | 36.8 | 7.5 | 0.05 | 41.3 | 3.5 | 0.05 |
| 2 | 700 | 26.5 | 7.3 | 0.06 | 35.8 | 4.8 | 0.05 |
| 3 | 1400 | 14.9 | 5.4 | 0.10 | 27.3 | 6.0 | 0.06 |
| 4 | 2800 | 5.8 | 2.1 | 0.20 | 16.8 | 5.1 | 0.09 |
| 5 | 2800 | 2.3 | .3 | 0.50 | 10.4 | 2.0 | 0.15 |
| 6 | 4200 | .7 | .1 | 1.38 | 5.4 | .9 | 0.26 |



| | |
|---------------|------|
| DESIGNED BY | DATE |
| DRAWN BY | |
| TRACED BY | |
| DESIGNED BY | |
| QUANTITIES BY | |
| CHECKED BY | |
| NO. | |

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. OBSERVATION OF CONSTRUCTION IS DEFINED IN CHAPTER 16-115, HAWAII ADMINISTRATIVE RULES, ENTITLED "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS".

 Signature: *Walter G. C. Chong* 4/30/22

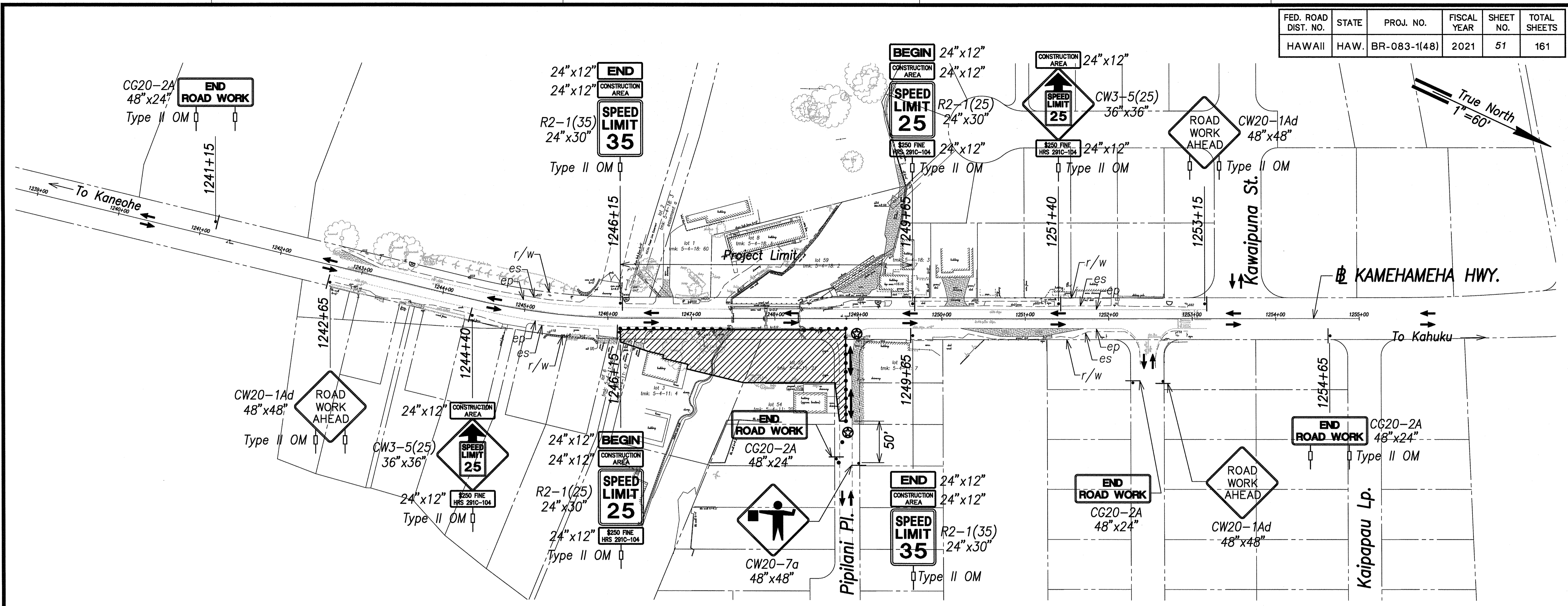
 R. M. TOWILL CORPORATION LIC. EXPIRATION

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

CRASH CUSHION DETAILS
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

Scale: As Noted Date: February 2021
SHEET No. C-48 OF SHEETS

| | | | | | |
|---------------------|-------|--------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 51 | 161 |



TRAFFIC CONTROL PLAN - PHASE 1A
Scale: 1"=60'

Work Zone Notes:

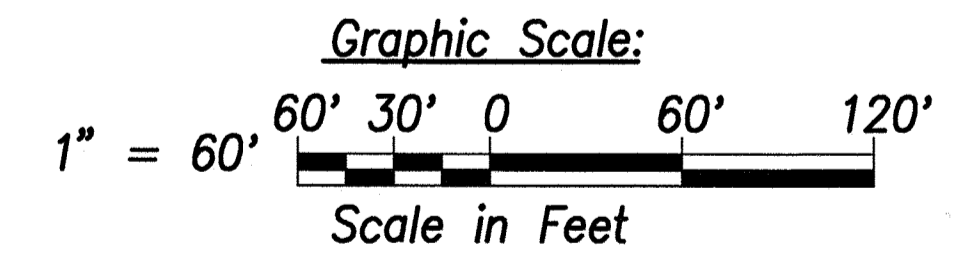
1. This Work Zone Sign Plan is intended for use on long-term stationary work zones/construction phases (3 days or more). All work zones or construction phases less than 3 days duration will use Traffic Control Plans shown in Section 645 of the Special Provisions.
2. All existing regulatory speed limit signs with posts within the work zone/project limits shall be removed and replaced with work zone speed limit sign assemblies (R2-1(25) and CW3-5(25) with "CONSTRUCTION AREA" and "\$250 FINE HRS 291C-104" Supplemental Signs).
3. Construction sign assemblies shall be installed on both the approaching and trailing ends of each work zone as shown on this plan.
4. Each construction warning sign shall have a minimum of two (2) Type II OM. Each work zone speed limit assembly shall have a minimum of one (1) Type II OM. Installation of each Type II OM shall be considered incidental to Item No. 645.1000, Construction Sign with Posts.
5. Contractor shall obtain acceptance of work within each phase from the Engineer before proceeding to the next phase. Phases shall be worked on in numerical/alphabetical order. Upon the completion of all physical work or as directed by the Engineer, all construction signs and work zone speed limit assemblies shall be removed. All speed limit signs and posts that were existing at the start of the project within the work zone/project limits shall be restored back to their original locations and configurations.
6. Placement of construction signs shall not obstruct the path of pedestrians and bicyclists.
7. The removal and restoration of existing regulatory speed limit signs with new posts along with the installation, maintenance and removal of work zone speed limit sign assemblies shall be considered incidental to Item No. 645.1000, Construction Sign with Posts.

Pipilani Contra-Flow Note:

The contractor shall provide special duty police officers at all times, including nights and weekends while work on Pipilani Place requiring contra-flow conditions exists. Provide adequate lighting for special duty police officers during night work. Cost shall be considered incidental to Item No. 645.1000.

Legend:

- Drums or delineators at spacing shown on plan
- † Sign
- ▨ Work Area
- ← Direction of Traffic Flow
- ⊙ Police Officer



| EXISTING POSTED SPEED LIMIT (MPH) | NEW CONSTRUCTION AREA SPEED LIMIT (MPH) | D-REDUCED SPEED LIMIT SIGN SPACING TO FIRST CONSTRUCTION AREA SPEED LIMIT SIGN (FEET) |
|-----------------------------------|---|---|
| 35 | 25 | 175 |

WALTER G. C. CHENG
LICENSED PROFESSIONAL ENGINEERS
No. 8962-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. OBSERVATION OF CONSTRUCTION IS DEFINED IN CHAPTER 18-115, HAWAII ADMINISTRATIVE RULES, ENTITLED "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS."

Walter G. C. Cheng 4/30/22
SIGNATURE LIC. EXPIRATION
R. M. TOWELL CORPORATION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC CONTROL PLAN - PHASE 1A

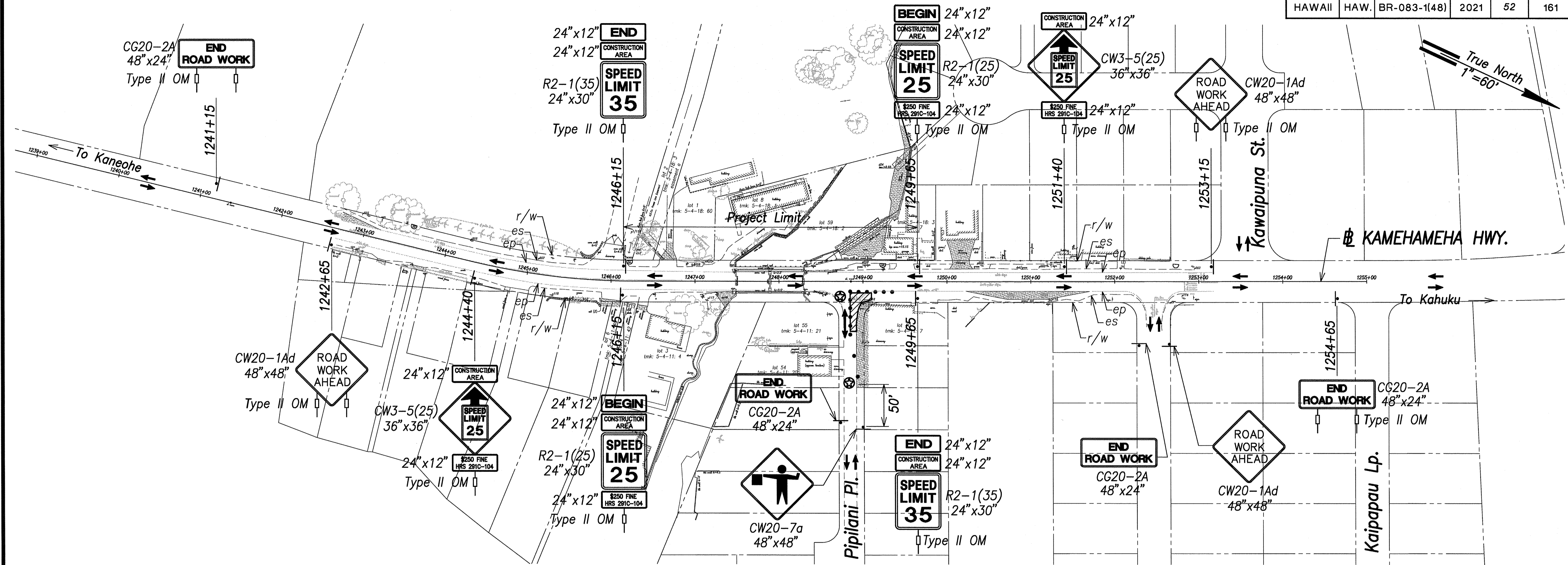
*Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)*

Scale: As Noted Date: February 2021

SHEET No. C-49 OF SHEETS

| | |
|---------------|------|
| DESIGNED BY | DATE |
| TRACED BY | |
| DESIGNED BY | |
| QUANTITIES BY | |
| CHECKED BY | |
| ORIGINAL PLAN | |
| NOTE BOOK | |
| No. | |

| | | | | | |
|---------------------|-------|--------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 52 | 161 |



TRAFFIC CONTROL PLAN - PHASE 1B
Scale: 1"=60'

Pipilani Contra-Flow Note:

The contractor shall provide a special duty police officer at all times, including nights and weekends while work on Pipilani Place requiring contra-flow conditions exists. Cost shall be considered incidental to Item No. 645.1000.

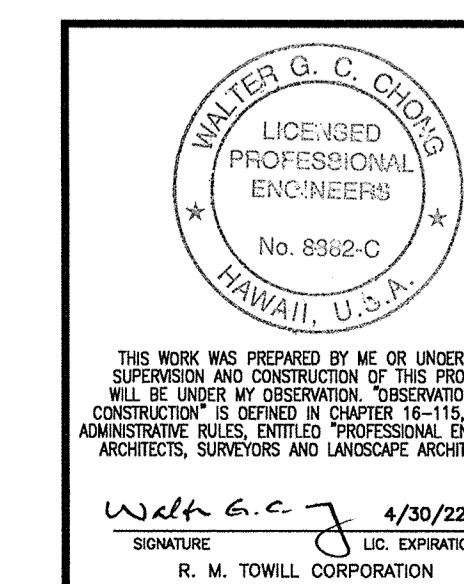
Legend:

- • • Cones or delineators at spacing shown on plan
- † Sign
- ▨ Work Area
- ← Direction of Traffic Flow
- ⊙ Police Officer

Work Zone Notes:

- This Work Zone Sign Plan is intended for use on long-term stationary work zones/construction phases (3 days or more). All work zones or construction phases less than 3 days duration will use Traffic Control Plans shown in Section 645 of the Special Provisions.
- All existing regulatory speed limit signs with posts within the work zone/project limits shall be removed and replaced with work zone speed limit sign assemblies (R2-1(25) and CW3-5(25) with "CONSTRUCTION AREA" and "\$250 FINE HRS 291C-104" Supplemental Signs).
- Construction sign assemblies shall be installed on both the approaching and trailing ends of each work zone as shown on this plan.
- Each construction warning sign shall have a minimum of two (2) Type II OM. Each work zone speed limit assembly shall have a minimum of one (1) Type II OM. Installation of each Type II OM shall be considered incidental to Item No. 645.1000, Construction Sign with Posts.
- Upon the completion of all physical work or as directed by the Engineer, all construction signs and work zone speed limit assemblies shall be removed. All speed limit signs and posts that were existing at the start of the project within the work zone/project limits shall be restored back to their original locations and configurations.
- Placement of construction signs shall not obstruct the path of pedestrians and bicyclists.
- The removal and restoration of existing regulatory speed limit signs with new posts along with the installation, maintenance and removal of work zone speed limit sign assemblies shall be considered incidental to Item No. 645.1000, Construction Sign with Posts.

| EXISTING POSTED SPEED LIMIT (MPH) | NEW CONSTRUCTION AREA SPEED LIMIT (MPH) | D-REDUCED SPEED LIMIT SIGN SPACING TO FIRST CONSTRUCTION AREA SPEED LIMIT SIGN (FEET) |
|-----------------------------------|---|---|
| 35 | 25 | 175 |



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

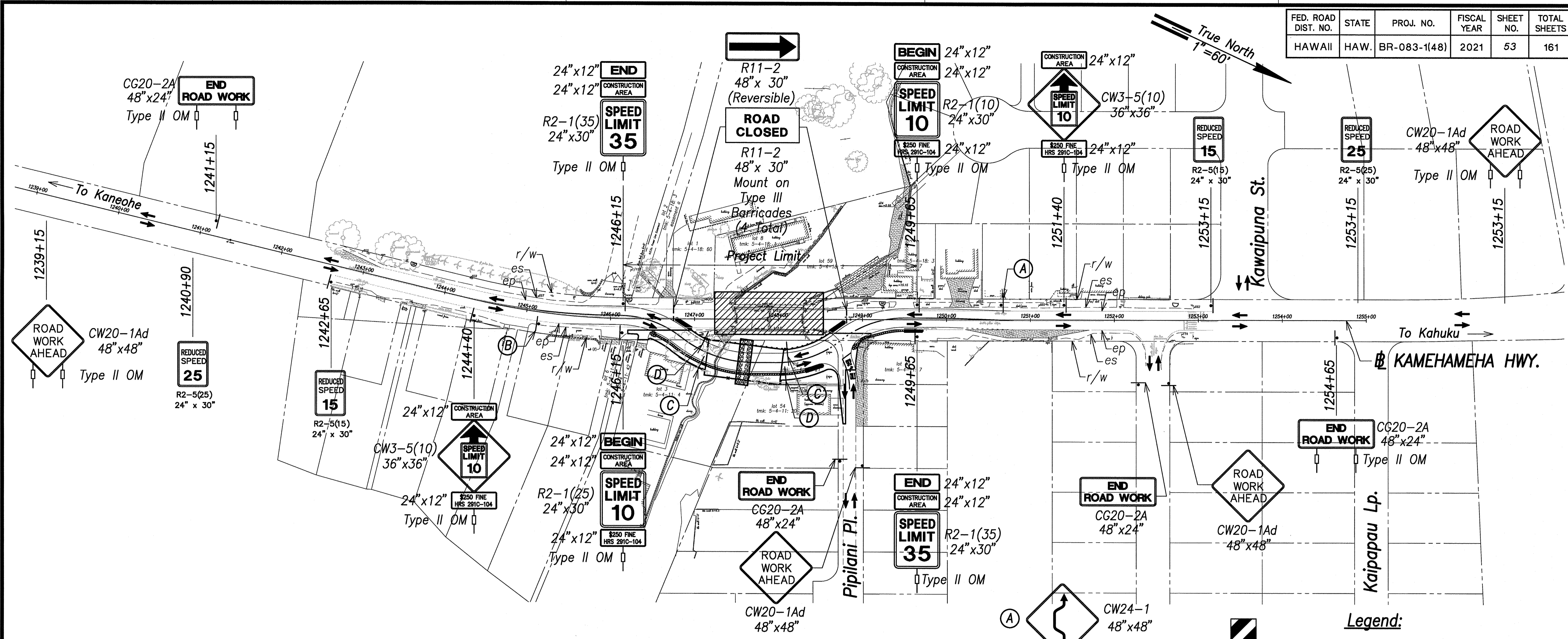
TRAFFIC CONTROL PLAN - PHASE 1B

*Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)*

Scale: As Noted Date: February 2021

SHEET No. C-50 OF SHEETS

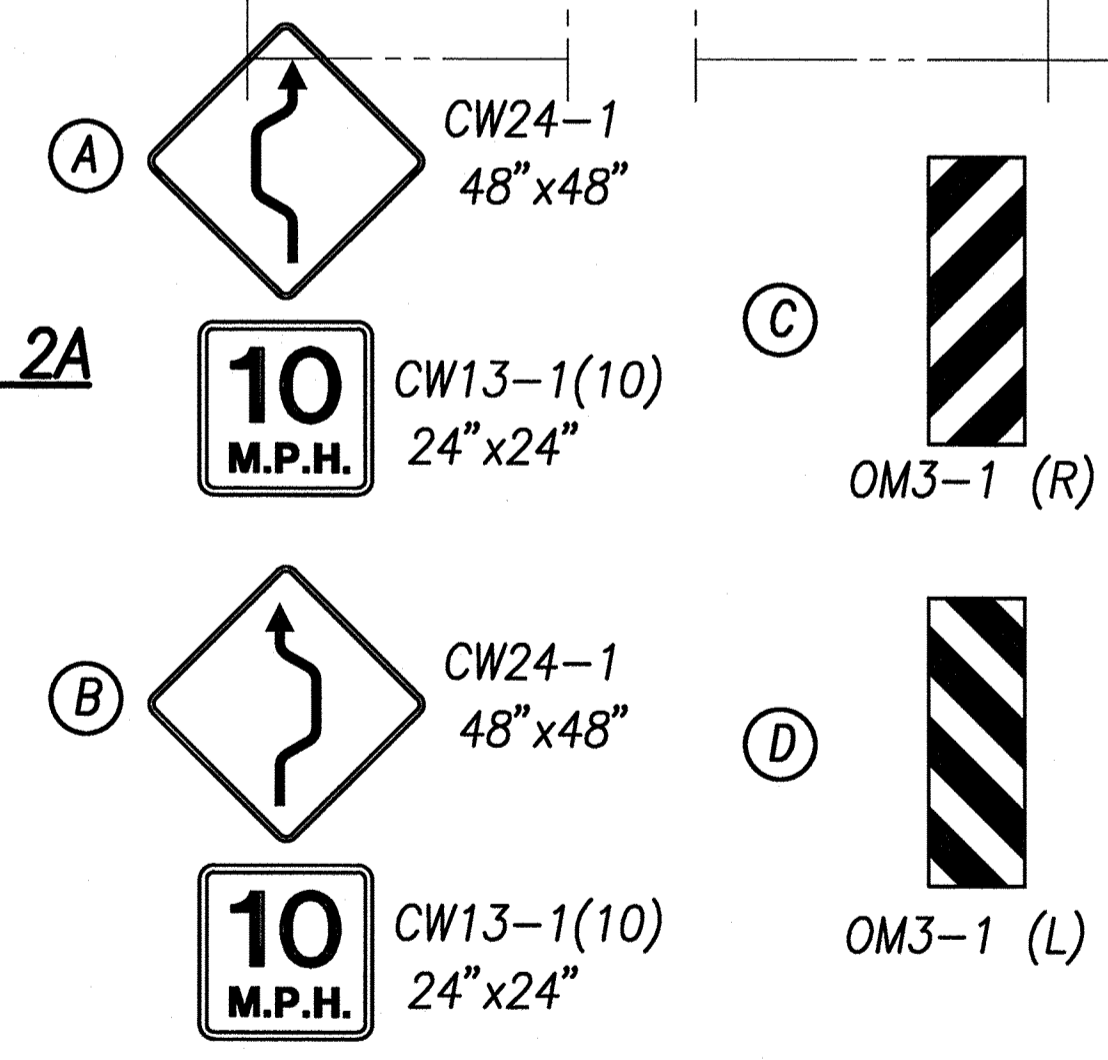
| | |
|--------------|------|
| DESIGNED BY | DATE |
| DRAWN BY | |
| CHECKED BY | |
| IN CHARGE BY | |
| NO. | |



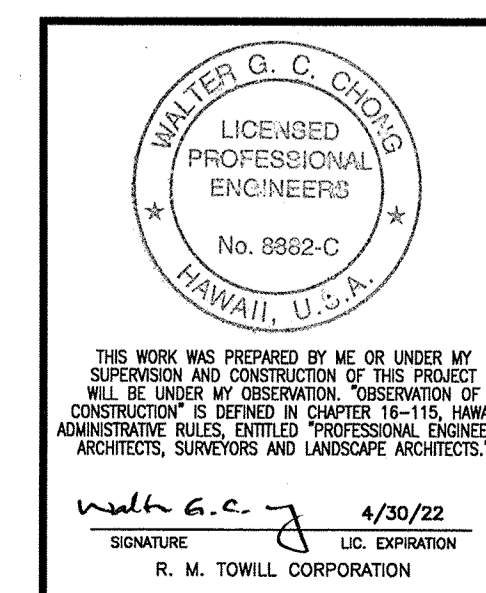
LONG TERM TRAFFIC CONTROL PLAN - PHASE 2A
Scale: 1"=60'

Work Zone Notes:

1. This Work Zone Sign Plan is intended for use on long-term stationary work zones/construction phases (3 days or more). All work zones or construction phases less than 3 days duration will use Traffic Control Plans shown in Section 645 of the Special Provisions.
2. All existing regulatory speed limit signs with posts within the work zone/project limits shall be removed and replaced with work zone speed limit sign assemblies (R2-1(25) and CW3-5(25) with "CONSTRUCTION AREA" and "\$250 FINE HRS 291C-104" Supplemental Signs).
3. Construction sign assemblies shall be installed on both the approaching and trailing ends of each work zone as shown on this plan.
4. Each construction warning sign shall have a minimum of two (2) Type II OM. Each work zone speed limit assembly shall have a minimum of one (1) Type II OM. Installation of each Type II OM shall be considered incidental to Item No. 645.1000, Construction Sign with Posts.
5. Upon the completion of all physical work or as directed by the Engineer, all construction signs and work zone speed limit assemblies shall be removed. All speed limit signs and posts that were existing at the start of the project within the work zone/project limits shall be restored back to their original locations and configurations.
6. Placement of construction signs shall not obstruct the path of pedestrians and bicyclists.
7. The removal and restoration of existing regulatory speed limit signs with new posts along with the installation, maintenance and removal of work zone speed limit sign assemblies shall be considered incidental to Item No. 645.1000, Construction Sign with Posts.



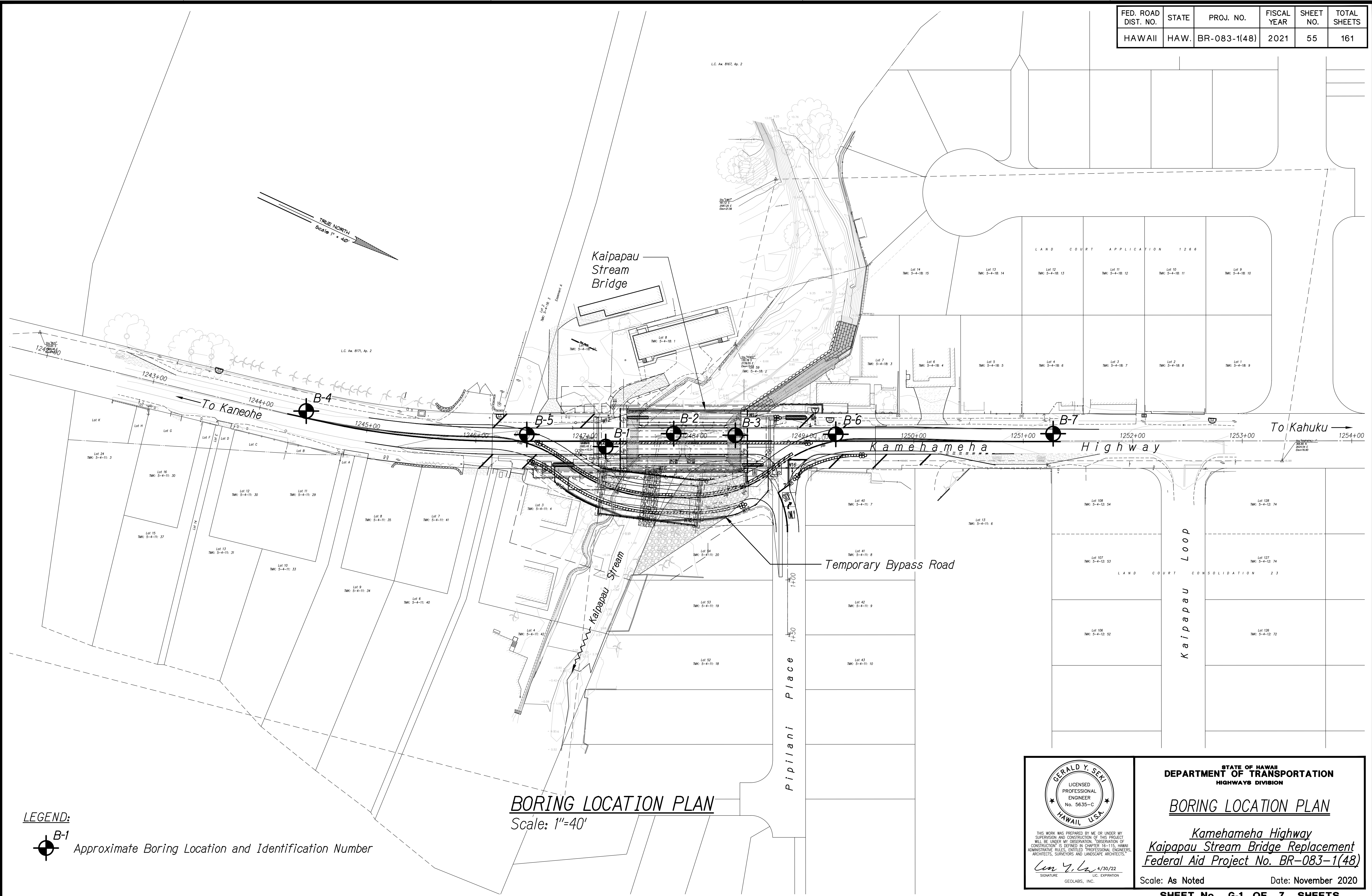
| EXISTING POSTED SPEED LIMIT (MPH) | NEW CONSTRUCTION AREA SPEED LIMIT (MPH) | D-REDUCED SPEED LIMIT SIGN SPACING TO FIRST CONSTRUCTION AREA SPEED LIMIT SIGN (FEET) |
|-----------------------------------|---|---|
| 35 | 10 | 175 |




STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
LONG TERM
TRAFFIC CONTROL PLAN - PHASE 2A
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)
Scale: As Noted Date: February 2021

| | |
|---------------|-----|
| DATE | BY |
| DESIGNED BY | TC |
| DRAWN BY | TC |
| CHECKED BY | TC |
| APPROVED BY | TC |
| ORIGINAL PLAN | No. |
| NOTE BOOK | No. |


| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 55 | 161 |



BORING LOCATION PLAN
Scale: 1"=40'

LEGEND:
 **B-1**
 Approximate Boring Location and Identification Number

| | |
|-------------------|------|
| SURVEY PLOTTED BY | DATE |
| DRAWN BY | REV |
| CHECKED BY | WC |
| QUANTITIES BY | |
| CHECKED BY | |
| ORIGINAL PLAN | No. |
| NOTE BOOK | |


 LICENSED PROFESSIONAL ENGINEER
 No. 5635-C
 HAWAII, U.S.A.
 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. OBSERVATION OF CONSTRUCTION IS DEFINED IN CHAPTER 100-115, HAWAII ADMINISTRATIVE RULES, ENTITLED "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS."
 Signature: *Gerald Y. Seki* 4/30/22
 GEOLABS, INC. LIC. EXPIRATION

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
BORING LOCATION PLAN
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)
 Scale: As Noted Date: November 2020
SHEET No. G-1 OF 7 SHEETS

| | | | | | |
|---------------------|-------|--------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 56 | 161 |

GEOLABS, INC.

Geotechnical Engineering

Rock Log Legend

ROCK DESCRIPTIONS

| | | | |
|--|----------|--|--------------|
| | BASALT | | FINGER CORAL |
| | BOULDERS | | LIMESTONE |
| | BRECCIA | | SANDSTONE |
| | CLINKER | | SILTSTONE |
| | COBBLES | | TUFF |
| | CORAL | | VOID/CAVITY |

ROCK DESCRIPTION SYSTEM

ROCK FRACTURE CHARACTERISTICS
The following terms describe general fracture spacing of a rock:

Massive: Greater than 24 inches apart

Slightly Fractured: 12 to 24 inches apart

Moderately Fractured: 6 to 12 inches apart

Closely Fractured: 3 to 6 inches apart

Severely Fractured: Less than 3 inches apart

DEGREE OF WEATHERING
The following terms describe the chemical weathering of a rock:

Unweathered: Rock shows no sign of discoloration or loss of strength.

Slightly Weathered: Slight discoloration inwards from open fractures.

Moderately Weathered: Discoloration throughout and noticeably weakened though not able to break by hand.

Highly Weathered: Most minerals decomposed with some corestones present in residual soil mass. Can be broken by hand.

Extremely Weathered: Saprolite. Mineral residue completely decomposed to soil but fabric and structure preserved.

HARDNESS
The following terms describe the resistance of a rock to indentation or scratching:

Very Hard: Specimen breaks with difficulty after several "pinging" hammer blows. Example: Dense, fine grain volcanic rock

Hard: Specimen breaks with some difficulty after several hammer blows. Example: Vesicular, vugular, coarse-grained rock

Medium Hard: Specimen can be broken by one hammer blow. Cannot be scraped by knife. SPT may penetrate by ~25 blows per inch with bounce. Example: Porous rock such as clinker, cinder, and coral reef

Soft: Can be indented by one hammer blow. Can be scraped or peeled by knife. SPT can penetrate by ~100 blows per foot. Example: Weathered rock, chalk-like coral reef

Very Soft: Crumbles under hammer blow. Can be peeled and carved by knife. Can be indented by finger pressure. Example: Saprolite

Plate
A-0.2

LOG LEGEND FOR ROCK 5014-00.GPJ, GEOLABS.GDT 3/13/14

| | | | |
|-------------------|------|-----|-----|
| SURVEY PLOTTED BY | DATE | REV | NO. |
| DRAWN BY | | | |
| NOTE BOOK | | | |
| QUANTITIES BY | | | |
| CHECKED BY | | | |

GEOLABS, INC.

Geotechnical Engineering

Soil Log Legend

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

| MAJOR DIVISIONS | | USCS | TYPICAL DESCRIPTIONS |
|----------------------|-----------------|---|--|
| COARSE-GRAINED SOILS | GRAVELS | CLEAN GRAVELS LESS THAN 5% FINES | GW WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES |
| | | GRAVELS WITH FINES | GP POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES |
| | | GRAVELS WITH FINES MORE THAN 12% FINES | GM SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES |
| | SANDS | CLEAN SANDS LESS THAN 5% FINES | SW WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES |
| | | SANDS WITH FINES | SP POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES |
| | | SANDS WITH FINES MORE THAN 12% FINES | SM SILTY SANDS, SAND-SILT MIXTURES |
| FINE-GRAINED SOILS | SILTS AND CLAYS | LIQUID LIMIT LESS THAN 50 | ML INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY |
| | | LIQUID LIMIT 50 OR MORE | CL INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS |
| | | LIQUID LIMIT 50 OR MORE | OL ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY |
| | SILTS AND CLAYS | LIQUID LIMIT 50 OR MORE | MH INORGANIC SILT, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS |
| | | LIQUID LIMIT 50 OR MORE | CH INORGANIC CLAYS OF HIGH PLASTICITY |
| | | LIQUID LIMIT 50 OR MORE | OH ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS |
| HIGHLY ORGANIC SOILS | | PT | PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS |

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

LEGEND

- (2-INCH) O.D. STANDARD PENETRATION TEST
- (3-INCH) O.D. MODIFIED CALIFORNIA SAMPLE
- SHELBY TUBE SAMPLE
- GRAB SAMPLE
- CORE SAMPLE
- WATER LEVEL OBSERVED IN BORING AT TIME OF DRILLING
- WATER LEVEL OBSERVED IN BORING AFTER DRILLING
- WATER LEVEL OBSERVED IN BORING OVERNIGHT

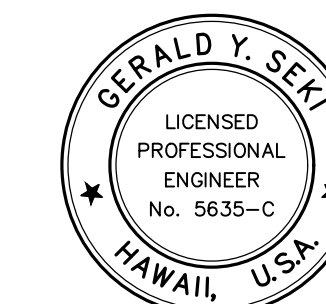
- LL LIQUID LIMIT (NP=NON-PLASTIC)
- PI PLASTICITY INDEX (NP=NON-PLASTIC)
- TV TORVANE SHEAR (tsf)
- PEN POCKET PENETROMETER (tsf)
- UC UNCONFINED COMPRESSION (psi)
- UU UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (ksf)

Plate
A-0.1

LOG LEGEND FOR SOIL 5014-00.GPJ, GEOLABS.GDT 3/13/14

GEOTECHNICAL NOTES:

1. A geotechnical engineering report entitled "Geotechnical Engineering Exploration, Kamehameha Highway (Route 83), Kaipapau Stream Bridge Replacement, Koolauloa, Oahu, Hawaii" dated August 6, 2014 has been prepared by Geolabs, Inc. A copy of the report is on file at the office of the Engineer for review by the Contractor.
2. For boring locations, see Sheet G-1.
3. The information presented in the logs of borings depict the subsurface conditions encountered at that specified location and at the time of the field exploration only. Variations of subsoil conditions from those depicted in the logs of borings may occur between and beyond the borings.
4. The penetration resistance shown on the logs of borings indicate the number of blows required for the specific sampler type used. The blow counts may need to be factored to obtain the Standard Penetration Test (SPT) blow counts.
5. The data given is for general information only. Bidders shall examine the site and the boring data and draw their own conclusions therefrom as to the character of materials to be encountered. The Engineer will not assume responsibility for variations of subsoil quality or conditions other than at the boring locations shown and at the time the borings were taken.



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Gerald Y. Seki 1/30/22
 SIGNATURE LIC. EXPIRATION
 GEOLABS, INC.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

BORING LOG LEGENDS & NOTES

Kamehameha Highway
 Kaipapau Stream Bridge Replacement
 Federal Aid Project No. BR-083-1(48)

Scale: No Scale Date: November 2020

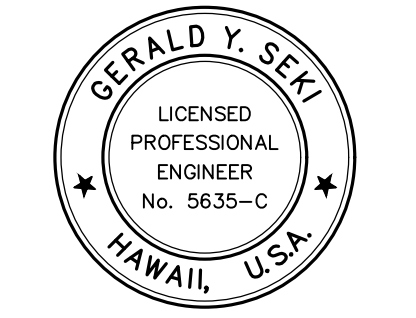
SHEET No. G-2 OF 7 SHEETS

| | | | | | |
|---------------------|-------|--------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 59 | 161 |

| Other Tests | | Moisture Content (%) | | Dry Unit Weight (pcf) | Core Recovery (%) | RQD (%) | Penetration Resistance (blows/foot) | Pocket Pen (tsf) | Depth (feet) | Sample Graphic | USCS | Description |
|---|--|----------------------|--|-----------------------|-------------------|---------|-------------------------------------|------------------|--------------|----------------|------|-------------|
| <p>GEOLABS, INC. Geotechnical Engineering</p> <p>KAMEHAMEHA HIGHWAY (ROUTE 83) KAIPAPAU STREAM BRIDGE REPLACEMENT KOOLAULOA, OAHU, HAWAII</p> <p>Log of Boring 3</p> <p>Approximate Ground Surface Elevation (feet MSL): 12 *</p> | | | | | | | | | | | | |
| <p>(Continued from previous plate)</p> | | | | | | | | | | | | |
| <p>9-inch ASPHALTIC CONCRETE</p> | | | | | | | | | | | | |
| <p>Brown SANDY GRAVEL (CORALLINE) with silt, dense, dry (base course)</p> | | | | | | | | | | | | |
| <p>Brown with multi-color mottling CLAYEY SILT with extremely weathered gravel (basaltic), medium stiff, moist (fill)</p> | | | | | | | | | | | | |
| <p>Brown with multi-color mottling fine SANDY SILT with gravel (basaltic), medium stiff, damp (fill)</p> | | | | | | | | | | | | |
| <p>Dark brown SILTY SAND with gravel, very loose (recent alluvium)</p> | | | | | | | | | | | | |
| <p>grades with organic matter</p> | | | | | | | | | | | | |
| <p>Dark brown poorly graded SAND with some well-rounded gravel in a silt matrix, very loose (recent alluvium)</p> | | | | | | | | | | | | |
| <p>grades with well-rounded cobbles and boulders (basaltic)</p> | | | | | | | | | | | | |
| <p>10/0' Ref.</p> | | | | | | | | | | | | |
| <p>Brown with multi-color mottling CLAYEY ROUNDED GRAVEL (BASALTIC) with sand, medium dense (old alluvium)</p> | | | | | | | | | | | | |
| <p>Brown with multi-color mottling SANDY CLAY with rounded gravel (basaltic), medium stiff (old alluvium)</p> | | | | | | | | | | | | |
| <p>1.0</p> | | | | | | | | | | | | |
| <p>1.0</p> | | | | | | | | | | | | |
| <p>Brown with multi-color mottling rounded GRAVEL (BASALTIC) with sand and silt in a clay matrix, slightly cemented, dense (old alluvium)</p> | | | | | | | | | | | | |
| <p>Greenish gray with multi-color mottling slightly cemented COBBLES AND BOULDERS (BASALTIC) with gravel in a clay matrix, dense (old alluvium)</p> | | | | | | | | | | | | |
| <p>grades to medium dense, breaks down to silty sand</p> | | | | | | | | | | | | |
| <p>grades to brown with multi-color mottling</p> | | | | | | | | | | | | |
| <p>Water Level: 9.7 ft. 08/22/2006 1310 HRS</p> | | | | | | | | | | | | |
| <p>Date Started: August 22, 2006</p> | | | | | | | | | | | | |
| <p>Date Completed: August 24, 2006</p> | | | | | | | | | | | | |
| <p>Logged By: Y. Chiba</p> | | | | | | | | | | | | |
| <p>Total Depth: 112 feet</p> | | | | | | | | | | | | |
| <p>Work Order: 5014-00</p> | | | | | | | | | | | | |
| <p>Drill Rig: CME-75</p> | | | | | | | | | | | | |
| <p>Driving Energy: 140 lb. wt., 30 in. drop</p> | | | | | | | | | | | | |

| Other Tests | | Moisture Content (%) | | Dry Unit Weight (pcf) | Core Recovery (%) | RQD (%) | Penetration Resistance (blows/foot) | Pocket Pen (tsf) | Depth (feet) | Sample Graphic | USCS | Description |
|--|--|----------------------|--|-----------------------|-------------------|---------|-------------------------------------|------------------|--------------|----------------|------|-------------|
| <p>GEOLABS, INC. Geotechnical Engineering</p> <p>KAMEHAMEHA HIGHWAY (ROUTE 83) KAIPAPAU STREAM BRIDGE REPLACEMENT KOOLAULOA, OAHU, HAWAII</p> <p>Log of Boring 3</p> | | | | | | | | | | | | |
| <p>(Continued from previous plate)</p> | | | | | | | | | | | | |
| <p>Brown with multi-color mottling SANDY CLAY, medium stiff (old alluvium)</p> | | | | | | | | | | | | |
| <p>Gray with multi-color mottling densely cemented COBBLES AND GRAVEL (BASALTIC), dense (weathered conglomerate)</p> | | | | | | | | | | | | |
| <p>grades to brownish gray with multi-color mottling, medium dense</p> | | | | | | | | | | | | |
| <p>grades to moderately cemented, dense</p> | | | | | | | | | | | | |
| <p>grades to gray with multi-color mottling, densely cemented</p> | | | | | | | | | | | | |
| <p>grades to reddish brown with black mottling</p> | | | | | | | | | | | | |
| <p>grades to very dense</p> | | | | | | | | | | | | |
| <p>Boring terminated at 112 feet</p> | | | | | | | | | | | | |
| <p>Water Level: 9.7 ft. 08/22/2006 1310 HRS</p> | | | | | | | | | | | | |
| <p>Date Started: August 22, 2006</p> | | | | | | | | | | | | |
| <p>Date Completed: August 24, 2006</p> | | | | | | | | | | | | |
| <p>Logged By: Y. Chiba</p> | | | | | | | | | | | | |
| <p>Total Depth: 112 feet</p> | | | | | | | | | | | | |
| <p>Work Order: 5014-00</p> | | | | | | | | | | | | |
| <p>Drill Rig: CME-75</p> | | | | | | | | | | | | |
| <p>Driving Energy: 140 lb. wt., 30 in. drop</p> | | | | | | | | | | | | |

| | |
|-------------------|------|
| SURVEY PLOTTED BY | DATE |
| DRAWN BY | REV |
| CHECKED BY | MC |
| QUANTITIES BY | |
| CHECKED BY | |



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Gerald Y. Seki 11/30/22
SIGNATURE LIC. EXPIRATION
GEOLABS, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 3

*Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)*

Scale: No Scale Date: November 2020

SHEET No. G-5 OF 7 SHEETS

| | | | | | |
|---------------------|-------|--------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 60 | 161 |

| G | | GEOLABS, INC. Geotechnical Engineering | | KAMEHAMEHA HIGHWAY (ROUTE 83) KAIPAPAU STREAM BRIDGE REPLACEMENT KOOLAULOA, OAHU, HAWAII | | Log of Boring 4 | |
|--|----------------------|---|-------------------|--|-------------------------------------|--------------------|--------------|
| Other Tests | Moisture Content (%) | Dry Unit Weight (pcf) | Core Recovery (%) | RQD (%) | Penetration Resistance (blows/foot) | Pocket Pen (tsf) | Depth (feet) |
| | 20 | 83 | | | 33 | | |
| | 7 | | | | 18 | | |
| | 27 | | | | 6 | | 5 |
| | 28 | | | | 2 | | 10 |
| Sieve #200 = 1.1% | 17 | | | | 5 | | 15 |
| Approximate Ground Surface Elevation (feet MSL): 9 * | | | | | | | |
| Description | | | | | | | |
| | | | | | | | SW |
| | | | | | | | SP |
| | | | | | | | SM |
| | | | | | | | GW |
| | | | | | | | SM |
| Boring terminated at 16.5 feet | | | | | | | |
| Water Level: ∇ 5.9 ft. 08/29/2006 0953 HRS | | | | | | | |
| Date Started: August 29, 2006 | | | | Date Completed: August 29, 2006 | | | |
| Logged By: Y. Chiba | | | | Drill Rig: CME-75 | | | |
| Total Depth: 16.5 feet | | | | Drilling Method: 4" Auger | | | |
| Work Order: 5014-00 | | | | Driving Energy: 140 lb. wt., 30 in. drop | | | |

| G | | GEOLABS, INC. Geotechnical Engineering | | KAMEHAMEHA HIGHWAY (ROUTE 83) KAIPAPAU STREAM BRIDGE REPLACEMENT KOOLAULOA, OAHU, HAWAII | | Log of Boring 5 | |
|---|----------------------|---|-------------------|--|-------------------------------------|--------------------|--------------|
| Other Tests | Moisture Content (%) | Dry Unit Weight (pcf) | Core Recovery (%) | RQD (%) | Penetration Resistance (blows/foot) | Pocket Pen (tsf) | Depth (feet) |
| LL=68 | 37 | 75 | | | 31 | 1.0 | |
| PI=41 | 33 | | | | 9 | 1.0 | |
| LL=64 | 35 | 78 | | | 6 | | 5 |
| PI=39 | | | | | | | |
| LL=54 | | | | | | | |
| PI=40 | 69 | | | | 6 | | 10 |
| | 32 | | | | 15 | | 15 |
| Approximate Ground Surface Elevation (feet MSL): 10 * | | | | | | | |
| Description | | | | | | | |
| | | | | | | | GW |
| | | | | | | | CH |
| | | | | | | | CH |
| | | | | | | | ML |
| | | | | | | | SP |
| Boring terminated at 16.5 feet | | | | | | | |
| Water Level: ∇ 8.4 ft. 08/28/2006 1348 HRS | | | | | | | |
| Date Started: August 28, 2006 | | | | Date Completed: August 28, 2006 | | | |
| Logged By: Y. Chiba | | | | Drill Rig: CME-75 | | | |
| Total Depth: 16.5 feet | | | | Drilling Method: 4" Auger | | | |
| Work Order: 5014-00 | | | | Driving Energy: 140 lb. wt., 30 in. drop | | | |

| | |
|-------------------|------|
| SURVEY PLOTTED BY | DATE |
| DRAWN BY | REV |
| TRACED BY | INC |
| NOTED BY | |
| CHECKED BY | |
| ORIGINAL PLAN | No. |



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Gerald Y. Seki 1/30/22
SIGNATURE LIC. EXPIRATION
GEOLABS, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 4

*Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)*

Scale: No Scale Date: November 2020

SHEET No. G-6 OF 7 SHEETS

| | | | | | |
|---------------------|-------|--------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 61 | 161 |

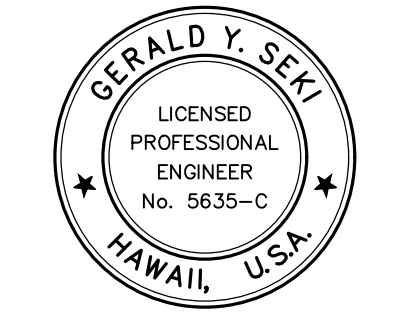
| G | | GEOLABS, INC. Geotechnical Engineering | | KAMEHAMEHA HIGHWAY (ROUTE 83) KAIPAPAU STREAM BRIDGE REPLACEMENT KOOLAULOA, OAHU, HAWAII | | Log of Boring 6 | |
|--|----------------------|---|-------------------|--|-------------------------------------|--------------------|---|
| Other Tests | Moisture Content (%) | Dry Unit Weight (pcf) | Core Recovery (%) | RQD (%) | Penetration Resistance (blows/foot) | Pocket Pen (tsf) | Depth (feet) |
| LL=56 PI=31 LL=56 PI=27 LL=55 PI=25 | 31 23 29 | 86 84 | | | 40 7 17 | 1.5 1.0 1.5 | 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 |
| | | | | | | | Sample Graphic |
| | | | | | | | USCS |
| | | | | | | | Approximate Ground Surface Elevation (feet MSL): 13 * |
| | | | | | | | Description |
| | | | | | | | 6-inch ASPHALTIC CONCRETE |
| | | | | | | | Tan SANDY GRAVEL (CORALLINE), dense, dry |
| | | | | | | | Dark brown CLAY with some rounded gravel (basaltic), stiff, damp |
| | | | | | | | Dark brown SILTY CLAY with sand, medium stiff to stiff, damp |
| | | | | | | | Dark brown SILT with clay and sand, stiff, damp grades with cobbles and boulders (basaltic) |
| | | | | | | | Dark brown with multi-color mottling rounded GRAVEL AND COBBLES (BASALTIC) with silt, dense, damp |
| | | | | | | | Boring terminated at 15 feet |
| | | | | | | | 15/0' Ref. |
| | | | | | | | 10/0' Ref. |
| | | | | | | | Water Level: ∇ Not Encountered |
| | | | | | | | Date Started: August 28, 2006 |
| | | | | | | | Date Completed: August 28, 2006 |
| | | | | | | | Logged By: Y. Chiba |
| | | | | | | | Total Depth: 15 feet |
| | | | | | | | Work Order: 5014-00 |
| | | | | | | | Drill Rig: CME-75 |
| | | | | | | | Driving Method: 4" Auger |
| | | | | | | | Driving Energy: 140 lb. wt., 30 in. drop |

| G | | GEOLABS, INC. Geotechnical Engineering | | KAMEHAMEHA HIGHWAY (ROUTE 83) KAIPAPAU STREAM BRIDGE REPLACEMENT KOOLAULOA, OAHU, HAWAII | | Log of Boring 7 | |
|---|----------------------|---|-------------------|--|-------------------------------------|--------------------|---|
| Other Tests | Moisture Content (%) | Dry Unit Weight (pcf) | Core Recovery (%) | RQD (%) | Penetration Resistance (blows/foot) | Pocket Pen (tsf) | Depth (feet) |
| LL=95 PI=64 Sieve #200 = 34.0% Sieve #200 = 8.9% | 26 17 30 | 84 85 | | | 28 10 18 | 1.0 1.0 | 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 |
| | | | | | | | Sample Graphic |
| | | | | | | | USCS |
| | | | | | | | Approximate Ground Surface Elevation (feet MSL): 15.5 * |
| | | | | | | | Description |
| | | | | | | | 6-inch ASPHALTIC CONCRETE |
| | | | | | | | Brownish gray SANDY GRAVEL (BASALTIC), dense, dry |
| | | | | | | | Dark brown with white and black mottling CLAY with some gravel (coralline), medium stiff to stiff, damp |
| | | | | | | | Light brownish tan SILTY SAND (CORALLINE), loose to medium dense, damp |
| | | | | | | | Brownish tan CLAYEY SILT, medium stiff to stiff, damp |
| | | | | | | | Dark brown with multi-color mottling SILTY SAND with some well-rounded gravel, medium dense, damp |
| | | | | | | | Dark brown GRAVEL with silt and sand, medium dense, damp grades with cobbles and boulders (basaltic) at 11.7 feet |
| | | | | | | | Boring terminated at 13 feet |
| | | | | | | | 10/0' Ref. |
| | | | | | | | Water Level: ∇ Not Encountered |
| | | | | | | | Date Started: August 28, 2006 |
| | | | | | | | Date Completed: August 28, 2006 |
| | | | | | | | Logged By: Y. Chiba |
| | | | | | | | Total Depth: 13 feet |
| | | | | | | | Work Order: 5014-00 |
| | | | | | | | Drill Rig: CME-75 |
| | | | | | | | Driving Method: 4" Auger |
| | | | | | | | Driving Energy: 140 lb. wt., 30 in. drop |

| | |
|-------------------|------|
| SURVEY PLOTTED BY | DATE |
| DRAWN BY | REV |
| NOTED BY | MC |
| CHECKED BY | |
| ORIGINAL PLAN | No. |

BORING LOG DOT 5014-00 (P1) GEOLABS (DOT) B414

BORING LOG DOT 5014-00 (P1) GEOLABS (DOT) B414



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Gerald Y. Seki 11/30/22
SIGNATURE LIC. EXPIRATION
GEOLABS, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS - 5

*Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)*

Scale: No Scale Date: November 2020

SHEET No. G-7 OF 7 SHEETS

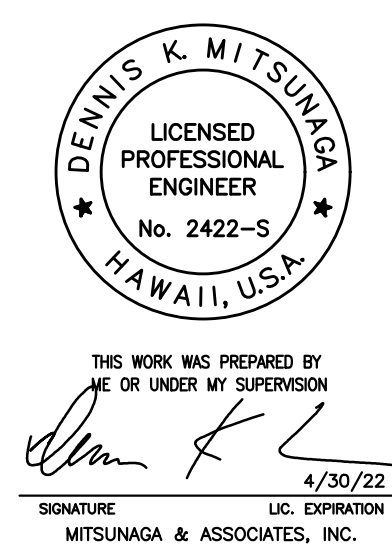
SYMBOLS AND ABBREVIATIONS

| | | | | | |
|------------------------|-------|--------------------------|----------------|--------------|-----------------|
| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 64 | 161 |

| | | | | |
|--|--|---|---|---|
| <p>¢ And</p> <p>@ At</p> <p>Ⓢ Baseline</p> <p>Ⓢ Centerline</p> <p>∅ Diameter</p> <p>≥ Greater Than or Equal to</p> <p>≤ Less Than or Equal to</p> <p># Number</p> <p>± Plus or Minus</p> <p>AB Anchor Bolt</p> <p>Abut. Abutment</p> <p>AC Asphaltic Concrete</p> <p>Add. Additional, Added</p> <p>Alt. Alternate</p> <p>Approx. Approximate</p> <p>Az. Azimuth</p> <p>B, Bot., Bott. Bottom</p> <p>Bal. Balance</p> <p>Bet. Between</p> <p>BF Both Faces, Back Face</p> <p>BFE Bottom of Footing Elevation</p> <p>Bk. Back</p> <p>Blt. Bolt</p> <p>Bm. Beam</p> <p>BOF Bottom of Footing</p> <p>Br. Bridge</p> <p>Brg., Brgs. Bearing, Bearings</p> <p>BVC Beginning of Vertical Curve</p> <p>BW Both Ways</p> <p>Cant. Cantilever</p> <p>CBW Concrete Barrier Wall</p> <p>cc Center to Center</p> <p>CF Cubic Feet</p> <p>CFCW Continuous Flashing Compound Waterproofing</p> <p>CG Center of Gravity</p> <p>cgs Center to Gravity of Strands</p> <p>CIP Cast-in-Place</p> <p>CJ Control Joint</p> <p>Cl. Class</p> <p>Clr. Clearance</p> <p>CLSM Controlled Low Strength Material</p> <p>CO Clean Out</p> <p>Col. Column</p> <p>Conc. Concrete</p> <p>Conn. Connection</p> <p>Const. Construction</p> <p>Const. Jt. Construction Joint</p> <p>Cont. Continuous</p> <p>CSL Cross Hole Sonic Logging</p> <p>CY, Cu. Yd. Cubic Yard</p> | <p>Dbl. Double</p> <p>Det. Detail</p> <p>DI Drain Inlet, Ductile Iron</p> <p>Dia. Diameter</p> <p>Diaph. Diaphragm</p> <p>Dim. Dimension</p> <p>Dist. Distance</p> <p>Dn. Down</p> <p>DO Ditto</p> <p>DS Drilled Shaft</p> <p>Dwg., Dwgs. Drawing, Drawings</p> <p>Dwls. Dowels</p> <p>E East</p> <p>(E), Exp. Expansion</p> <p>EA, Ea., ea. Each</p> <p>EF Each Face</p> <p>EFH Each Face Horizontal</p> <p>EFV Each Face Vertical</p> <p>EJ Expansion Joint</p> <p>El., Elev. Elevation</p> <p>Elec. Electrical</p> <p>EMH Electrical Manhole</p> <p>Emb. Embankment</p> <p>Embed. Embedded, Embedment</p> <p>EP Edge of Pavement</p> <p>EPS Expanded Polystyrene</p> <p>Eq. Equal</p> <p>Est. Estimated</p> <p>EVC End of Vertical Curve</p> <p>EW Each Way</p> <p>Ex., Exist. Existing</p> <p>Exc. Excavation</p> <p>Excl. Excluding</p> <p>Ext. Exterior</p> <p>(F) Fixed</p> <p>FA Force Account</p> <p>FB Flat Bar</p> <p>F'c Specified Strength of Concrete</p> <p>F'ci Strength of Concrete at Time of Initial Prestress</p> <p>FF Far Face, Front Face</p> <p>Fig. Figure</p> <p>Fin. Gr. Finish Grade</p> <p>FRP Fiber Reinforced Plastic</p> <p>Ft. Feet, Foot</p> <p>Ftg. Footing</p> <p>Ga. Gage, Gauge</p> <p>Galv. Galvanized</p> <p>GFRP Glass Fiber Reinforced Polymer</p> <p>Gr. Grade</p> <p>Grd. Ground</p> <p>GRP Grouted Rubble Pavement</p> | <p>(H) Hinge</p> <p>HECO Hawaiian Electric Company</p> <p>Horiz., H Horizontal</p> <p>HS High strength</p> <p>Ht. Height</p> <p>IB Inbound</p> <p>ID Inside Diameter</p> <p>I.F. Inside Face</p> <p>In. Inch</p> <p>Int. Interior</p> <p>Inv. Invert</p> <p>Jt. Joint</p> <p>K Kips</p> <p>KF Kip Foot</p> <p>KLF Kips Per Linear Foot</p> <p>KSF Kips Per Square Foot</p> <p>KSI Kips Per Square Inch</p> <p>L Length</p> <p>lb., lbs., LBS. Pound, Pounds</p> <p>LF, Lin. Ft. Linear Feet/Foot</p> <p>Longit. Longitudinal</p> <p>LS Lump Sum</p> <p>Ltg. Std. Lighting Standard</p> <p>M Modified</p> <p>Max. Maximum</p> <p>Mech. Mechanical</p> <p>MH Manhole</p> <p>Min. Minimum</p> <p>Misc. Miscellaneous</p> <p>MPH Miles Per Hour</p> <p>N North</p> <p>N/A Not Applicable</p> <p>NF Near Face</p> <p>NIC Not in Contract</p> <p>No. Number</p> <p>NTS Not to Scale</p> <p>OB Outbound</p> <p>oc On Center</p> <p>OD Outside Diameter</p> <p>O.F. Outside Face</p> <p>OG Outside Girder, Outbound Girder</p> <p>Opn'g Opening</p> <p>O/S Offset</p> <p>PB Pull Box</p> <p>P(e) Effective Prestressing Force</p> <p>PC Point of Curvature</p> <p>PCC Portland Cement Concrete</p> | <p>PCF Pounds per Cubic Foot</p> <p>Perf. Perforated</p> <p>PI Point of Intersection of Tangents</p> <p>PIVC Point of Intersection of Vertical Curve</p> <p>PL Plate</p> <p>PLF Pounds per Linear Foot</p> <p>PP Precast Plank</p> <p>PRC Point of Reverse Curvature</p> <p>Prestr. Prestressed</p> <p>P/S Prestressed Strands</p> <p>PSF Pounds per Square Foot</p> <p>PSI Pounds per Square Inch</p> <p>Pt., Pts. Point, Points</p> <p>PT Point of Tangency, Post Tensioned</p> <p>PVC Polyvinyl Chloride</p> <p>Q Flow Rate</p> <p>R, Rad. Radius</p> <p>Rdwy. Roadway</p> <p>Rebar Reinforcing Bar</p> <p>Ref. Reference</p> <p>Reinf. Reinforced, Reinforcing, Reinforcement</p> <p>Req'd. Required</p> <p>Ret. Retaining</p> <p>RF Rear Face</p> <p>R/W, ROW Right of Way</p> <p>S South</p> <p>SDMH Sewer Drain Manhole</p> <p>SE Super Elevation</p> <p>Sect. Section</p> <p>SF Square Feet</p> <p>Sht. Sheet</p> <p>Sim. Similar</p> <p>Sl. Slope</p> <p>Spc., Spg. Spaces, Spacing</p> <p>Spec. Specification</p> <p>Sprd. Spread</p> <p>SS Stainless Steel</p> <p>Sta. Station</p> <p>Stagg. Staggered</p> <p>Std. Standard</p> <p>Stiff. Stiffener</p> <p>Stirr. Stirrup</p> <p>Stl. Steel</p> <p>Str. Straight</p> <p>Struct. Structure</p> <p>SY Square Yard</p> <p>Symm. Symmetrical</p> | <p>T Top</p> <p>Tan. Tangent</p> <p>T∅B Top and Bottom</p> <p>Temp. Temporary</p> <p>Thk. Thick</p> <p>TFE Top of Footing Elevation</p> <p>TOD Top of Deck</p> <p>TOF Top of Footing</p> <p>Tot. Total</p> <p>TOW Top of Wall Elevation</p> <p>Transv. Transverse</p> <p>TS Structural Tubing</p> <p>Typ. Typical</p> <p>Undergrd. Underground</p> <p>UNO Unless Noted Otherwise</p> <p>V, Vert. Vertical</p> <p>Var. Varies</p> <p>VESLMC Very Early Strength Latex Modified Concrete</p> <p>VC Vertical Curve</p> <p>W West</p> <p>w/ With</p> <p>W/C Water/Cement Ratio</p> <p>WP Work Point, Working Point</p> <p>WS Water Surface</p> <p>WW Wing Wall</p> <p>WWR Welded Wire Reinforcing</p> <p>Yr. Year</p> |
|--|--|---|---|---|

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SYMBOLS AND ABBREVIATIONS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: None Date: February 2021

SHEET No. S03 OF 12 SHEETS

STRUCTURAL GENERAL NOTES

| | | | | | |
|------------------------|-------|--------------------------|----------------|--------------|-----------------|
| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
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1. GENERAL SPECIFICATIONS:

(A) Hawaii Department of Transportation, Hawaii Standard Specifications for Road and Bridge Construction, 2005, together with Special Provisions prepared for this Contract.

2. DESIGN SPECIFICATIONS:

(A) AASHTO 2012 LRFD Bridge Design Specifications (Sixth Edition) and its subsequent interim specifications with interim supplements and modifications by the HDOT Highways Division.

(B) HDOT Document dated March 1, 2013 with subject title "Design Criteria for Bridges and Structures"

(C) AASHTO 2013 Standard Specifications for structural supports for Highways, Signs, Luminaires, and Traffic Signals (Sixth Edition) and its subsequent interim specifications with interim supplements and modifications by the HDOT Highways Division.

3. LOADS:

(A) Dead Load: A 25 psf allowance for future wearing surface of asphalt concrete has been included in Dead Load calculations. Concrete unit weight of 160 pcf has been assumed for Dead Load calculations. A future utilities load on each side of the Bridge of 150 plf has been included.

(B) Live Load: HL-93 Service and Strength Limit States

(C) Seismic: In accordance with AASHTO LRFD Bridge Design Specifications, 6th Edition, 2012:

Peak Ground Acceleration (PGA = 0.18g), modified by the Site Coefficient ($F_{PGA} = 1.44$) to give a spectrum acceleration, $A_S = 0.26g$

Short period acceleration at 0.2 seconds ($S_S = 0.40g$) modified by the Site Coefficient ($F_a = 1.48$) to give the short period spectrum acceleration, $S_{DS} = 0.592g$

Long Period acceleration at 1.0 seconds ($S_1 = 0.11g$) modified by the Site Coefficient ($F_v = 2.36$) to give the long period spectrum acceleration, $S_{D1} = 0.260g$

Site Class = D
Seismic Zone = 2
Operational Category = Essential

(D) Federal Emergency Management Agency (FEMA)
-Flood Hazard Designation:

Zone: _____ AE
Base Flood Elevation: _____ El. = 14
(Upstream of Bridge)
Non-Bore Tsunami Run up: _____ El. = 10

3. LOADS (Cont.):

(E) Combined Scour Elevations:
Abutment No. 1: _____ 100 year Scour El. = -8.0
Abutment No. 2: _____ 100 year Scour El. = -8.0

(F) Railing Test Level TL-3
(G) Seismic Parameters for Segmental Retaining Wall - Refer to S12.5.

4. MATERIALS:

(A) All concrete strengths shall be as noted below:

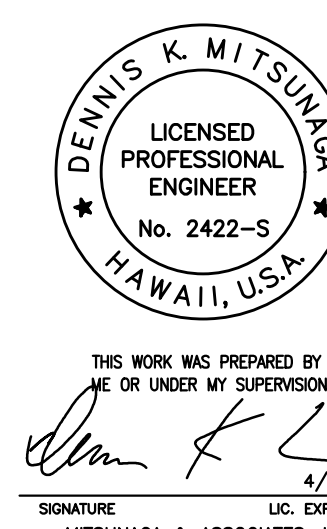
| Item No. | Structural Parts | Compressive Strength f'c (28 Days) | Maximum Water (W/C) | Maximum Cement (lbs/cyd) | Maximum Cementitious Material Content (lbs/cyd) |
|----------|--|--|---------------------------|--------------------------------|--|
| (1) | Drilled Shafts including Trial and Load Test Shafts See Note (E) in this section | 4500 psi | 0.45 | 720 | 720 |
| (2) | Drilled Shaft Cap Beam, End Beam, Aesthetic Railing, End Post, Concrete Barrier, Corbel for Approach Slab, Corbel for Conc. Encased Ducts, Diaphragms, Girder Seats, Barrier Wall, Wing Walls and Wing Wall return See Notes (D), (E), and (F) in this section | 5000 psi | 0.40 | 670 | 670 |
| (3) | Prestressed Girders See Note (E) in this section and Sheet S4.5 | 12000 psi | 0.40 | 670 | 752 |
| (4) | Precast Deck Form See Notes (D), (E) and (F) | 6000 psi | 0.40 | 670 | 670 |
| (5) | Bridge Deck, Topping over End Beam, Approach Slabs, Concrete encasing ducts within bridge, and Sleeper Slab. See Notes (D), (E) and (F). | SBD | -- | -- | -- |
| (6) | Temporary Bridge Abutments, Piers, Footings, and Miscellaneous Concrete | 4000 psi | 0.45 | 670 | 670 |
| (7) | Deck and End beam Closure Pours (Including Corbel), See Note (E) | VESLMC | - | - | - |
| (8) | Concrete for Waterline: | | | | |
| | a. Cradle See notes (D), (E), and (F) | 5000 psi | 0.40 | 670 | 670 |
| | b. Curtain wall shall be light weight concrete (Density < 120 lbs/cu. ft.) | 3000 psi | - | - | - |
| (9) | All others, except as noted otherwise | 4000 psi | 0.45 | 670 | 670 |

4. MATERIALS (Cont.):

- (B) Concrete mixes shall be designed to be pumpable and flowable with minimum segregation and separation.
- (C) The use of calcium chloride in any concrete is prohibited.
- (D) A shrinkage reducing admixture (SRA), such as Master Life SRA35 by BASF or Eclipse by W.R. Grace & Co., or accepted equal, shall be added to the concrete mix for Items No. (2), (4), (5) and (8)a, under note 4.(A). The minimum dosage requirement shall be 128 ounces per cubic yard of concrete. Include the weight of the SRA with the total water in computation of the Water to Cement Ratio.
- (E) A migrating corrosion inhibitor amine carboxylate water-based admixture shall be added to the concrete mix for Item Nos. (1), (2), (3), (4), (5), (7) and (8). under Note 4.(A). The minimum dosage shall be 24 ounces per cubic yard of concrete.
- (F) A 1 1/2" long macro synthetic fiber such as Forta Ferro, Strux 90/40, Max Matrix, or approved equal shall be added to the concrete mix for items No. (2), (4), (5) and (8)a. under note 4.(A). The minimum dosage shall be 7.5 pounds per cubic yard of concrete.
- (G) Non-shrink Grout shall be a pre-mixed product consisting of non-staining, non-metallic aggregate cement, water reducing and plasticizing agents capable of developing a minimum compressive strength of 4000 psi in 3 days and 7000 psi in 28 days. The non-shrink grout shall contain at least 10 grams of migrating amine carboxylate corrosion inhibiting admixture per 0.4 to 0.5 cubic feet of non-shrink grout.
- (H) Cure concrete as specified in the Contract documents. Remove curing that may affect bonding from all areas requiring future bonding unless a curing agent such as SINAK Lithium Cure or accepted equal that does not affect bond and provide equal or better curing is used.
- (I) All concrete shall include at least one of the three methods stated in Section 601 of the Special Provisions, or approved equal, to reduce the embodied carbon footprint in concrete.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STRUCTURAL GENERAL NOTES

**KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)**

Scale: None Date: February 2021

SHEET No. S04 OF 12 SHEETS

STRUCTURAL GENERAL NOTES

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|------------------------|-------|--------------------------|----------------|--------------|-----------------|
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| HAWAII | HAW. | BR-083-1(48) | 2021 | 66 | 161 |

4. MATERIALS (Cont.):

- (J) Unless otherwise noted, all reinforcing steel shall conform to the requirements of ASTM A615 and shall be deformed, Grade 60.
- (1) The covering measured from the surface of the concrete to the face of any reinforcing bars shall be as follows, except as otherwise shown:
- a. Deck Slabs
 - Top Bars = 2 3/4"
 - Bottom Bars = 2"
 - b. Prestressed Concrete Girders = Reference Sheet S4.2 & S4.4 for Girder Clearances
 - c. Drilled Shafts = 4"
 - d. Approach Slab and Sleeper Slab Top Bars = 2 3/4"
Approach Slab and Sleeper Slab Bottom Bars = 3"
 - e. Concrete Cast Against and Permanently Exposed to Earth = 3"
 - f. All Others Unless Otherwise Noted = 3"
- (2) Minimum lap splice length for steel reinforcing shall be 40 bar diameters or 2'-0", whichever is greater, for #8 bars or smaller. Minimum lap splice length for #9 bars or larger shall be 50 bar diameters. Increase lap length by multiplying the minimum lap splice length by 1.3 for bars having more than 12" of fresh concrete below bars. Increase lap length by 1.25 for ASTM A1035 reinforcing. Lap splices for bundled bars shall consist of individual bar splices within a bundle that do not overlap. Entire bundles shall not be lap spliced.
- (3) Unless otherwise noted, reinforcing splices shall be staggered. Minimum distance between staggered lap splice shall be equal to the length required for the lap splice. Number of bars spliced at sections normal to axis of member shall not exceed 50 percent of the total main reinforcing in the member.
- (4) Minimum clear spacing between parallel bars shall be 1 1/2 times the diameter of bars (for non bundled bars). In no case shall the clear distance between the bars be less than 1 1/2 times the maximum size of the coarse aggregate or 1 1/2".
- (5) Reinforcing bars shall be securely tied at all intersections and lap splices except where the spacing of intersections is less than 1 foot in each direction, in which case alternate intersections shall be tied.
- (K) All anchor bolts, washers, and nuts shall be ASTM A 307, F844, and A563 respectively; and ASTM F2329 hot dip galvanized after fabrication, unless otherwise specified.
- (L) Epoxy for anchoring threaded rods or deformed bars shall be HILTI-RE-500-SD or approved equal. Follow Manufacturer's recommendations for storage and use.

4. MATERIALS (Cont.):

- (M) Stainless Steel Reinforcing shall be provided at the Aesthetic Bridge Railings. Stainless Steel reinforcing shall be deformed reinforcement conforming to ASTM A955/2205 or 316LN with a minimum yield level of 60 ksi designated as Grade 60. See drawings for configuration, sizes, spacings, clearances and isolation details. All tie wire for Stainless Steel Reinforcing shall be 2205 Stainless. Place dielectric tape such as Teflon or polypropylene at all points where dissimilar metals are in contact.
- (N) Stainless Steel Metal Rails, Plates, Anchor Bolts and Shapes shall conform to ASTM A269, ASTM A276 or A666 Type 316LN/ UNS designation S31653 or Type 2205/UNS designation S32205.
- (P) For materials of prestressed concrete girders, see applicable prestressed concrete girder details and Special Provisions.
- (Q) All dimensions relating to reinforcing bars, are to centers of bars unless noted otherwise.
- (R) For concrete finish, see the Specifications.
- (S) Glass Fiber Reinforced Polymer Bar (ASTM D7957)
- (1) Glass Fiber Reinforced Polymer (GFRP) rebar shall have a minimum tensile force of 110 ksi for #4 bar. #5 bars shall have a minimum tensile force of 105 ksi.
 - (2) The modulus of elasticity of the GFRP bar shall be a minimum of 6,500,000 psi.
 - (3) Concrete cover for the GFRP bars shall be 2" unless otherwise noted.
 - (4) Minimum lap splice lengths for the GFRP bars shall be 42 bar diameters unless otherwise noted.
 - (5) All GFRP bars shall be securely tied in place. Tie wire shall be 2205 stainless steel or non-metallic.
 - (6) The GFRP bars may be cut in the field with a masonry or diamond blade.
 - (7) All work including materials and bends shall follow manufacturer's recommendations.

5. FOUNDATION NOTES:

- (A) The Foundation Design is based upon recommendations contained in the Geotechnical Engineering Exploration report entitled "Geotechnical Exploration, Kamehameha Highway (Route 83), Kaipapau Stream Bridge Replacement, Koolauloa, Oahu, Hawaii, August 6, 2014. The Report shall be considered as a part of the contract documents and its recommendations shall be implemented unless otherwise directed by the Engineer. The Contractor may obtain a copy of the report at the State of Hawaii, Department of Transportation - Highways Division - upon written request to the Engineer.

5. FOUNDATION NOTES (Cont.):

- (1) 4'-0" Diameter Drilled Shaft Foundations - See S8.1 for estimated shaft tip elevations.
- a. The drilled shaft foundations will derive support principally from adhesion between the sides of the drilled shaft and the dense old alluvium, conglomerate and/or basalt formation encountered in the Geotechnical Engineering borings.
- (2) Design Soil Parameters
- a. Static Lateral Earth Pressures at Abutments and Wing Walls above ground water:
 1. Active Condition, level backfill = 40 pcf
 2. At-Rest Condition, level backfill = 58 pcf
 - b. Static Lateral Earth Pressures at Abutments and Wing Walls below ground water:
 1. Active Condition, level backfill = 80 pcf
 2. At-Rest Condition, level backfill = 88 pcf
 - c. Seismic

| Dynamic Lateral Earth Forces for Retaining Structures | |
|--|--|
| Allowable Lateral Wall Movement (inches) | Dynamic Lateral Earth Forces (H ² pounds per linear foot) |
| 0.5 | 19.6 |
| 1.0 | 14.8 |
| 1.5 | 11.5 |
| 2.0 | 8.1 |
| 2.5 | 5.8 |

(B) For Drilled Shaft notes, see shts. S8.1 and S8.2.

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THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION
Dennis K. Mitsunaga
4/30/22
SIGNATURE LIC. EXPIRATION
MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STRUCTURAL GENERAL NOTES

**KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)**

Scale: None Date: February 2021

SHEET No. S05 OF 12 SHEETS

STRUCTURAL GENERAL NOTES

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6. CONSTRUCTION REQUIREMENTS:

- (A) Exact location of bars shall be arranged so that no interference will occur between vertical reinforcement and foundation or drilled shaft cap horizontal reinforcements.
- (B) Except as noted otherwise, all vertical dimensions are measured plumb.
- (C) The Contractor shall verify all grades and dimensions before commencing with any work.
- (D) The Contractor shall verify the locations of all existing utility lines near the bridge, abutments and retaining walls and notify their respective owners before commencing with the work of excavation, underpinning or drilling of shafts.
- (E) Any damage to utility lines caused by the Contractor or his agents or Sub-Contractors, shall be repaired at his expense and to the satisfaction of the Engineer.
- (F) Unless noted otherwise, all exposed concrete edges shall have a chamfer of 3/4 inch.
- (G) Temporary shoring/under-pinning and dewatering may be required for foundation excavations.
 - (1) The Contractor shall refer to the Geotechnical Engineering Exporation Report Referenced at "FOUNDATION NOTES" above for recommendations.
 - (2) Vibratory shoring (such as interlocking Steel Sheetpiling) will not be allowed.
 - (3) Temporary shoring / under-pinning and dewatering shall be in accordance with the Specifications and shall not proceed without the Engineer's Review and Approval.
 - (4) Temporary Shoring / under-pinning and dewatering shall be considered incidental to Structural Excavation.
 - (5) All Temporary Shoring / under-pinning and dewatering specifications, working drawings and structural calculations shall be signed and sealed by Hawaii licensed professional engineers specializing in Geotechnical and Structural Engineering. This work shall be acceptable to the Engineer before the start of construction and shall be considered incidental to the related Contract item.

6. CONSTRUCTION REQUIREMENTS (Cont.):

- (H) Bridge deck riding surface shall be longitudinally, mechanically ground a minimum of 1/8" over entire travel way and shoulder. The ground surface shall have a textured surface with peaks 1/16" above the bottom of the groove and 55 to 60 grooves per foot of width. After grinding, the deck shall also be longitudinally, mechanically grooved. See Section 503 of the specifications for additional information. The bridge shall not be open to public traffic until the mechanical grooving, all traffic safety devices and markers are complete and acceptable to the Engineer. Sidewalks on bridge shall receive a medium broom finish transverse to the sidewalk. Finish all other elements as directed in Section 503.
- (J) Explosive blasting is prohibited for demolition or any other work on this project.
- (K) Contractor's temporary shoring and falsework design and construction shall comply with the specifications, Special Provision 503.03 (B), AASHTO Guide Design Specifications for Bridge Temporary Work (latest edition) and AASHTO Construction Handbook for Bridge Temporary Works (latest edition). The most stringent requirements shall govern.
- (L) Girders shall be rinsed with potable water to remove salt spray from ocean transport before arrival at jobsite. Notify Engineer for verification of rinsing operation.

7. PRESTRESSED GIRDER BEARING SURFACES:

- (A) Prestressed girder bearing surface shall be smooth.
- (B) Girders shall be set on fresh layers of slush grout to ensure full bearing.
- (C) When a Girder is removed from its casting bed, all bars and strands projecting from the Girder shall be cleaned and painted with a miniumum dry film thickness of 1-mil galvanizing high zinc dust paint conforming to Federal Specification MIL-P-21035B. During handling and shipping, projecting reinforcement shall be protected from bending or breaking. Just before placing concrete around the painted projecting bars or strands, the Contractor shall remove from them all spattered concrete remaining from girder casting, dirt, oil, and other foreign matter.

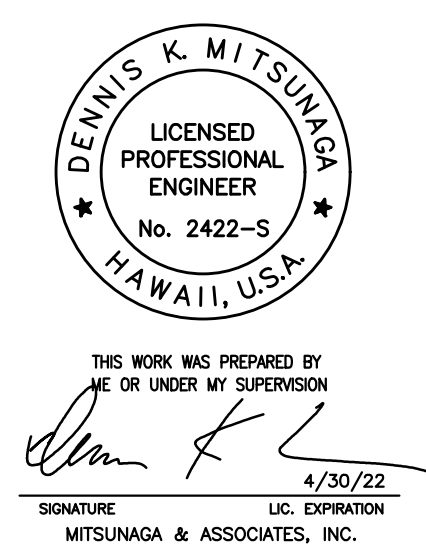
8. LOAD RATING:

- (A) New governing Load Rating results are as follows:

| | | RATING FACTOR | DISTRIBUTION FACTOR | LOAD EFFECT |
|--------|-----------------|------------------|------------------------|-------------|
| DESIGN | HL-93 Inventory | 1.28 | 0.378 | Neg. Moment |
| | HL-93 Operating | 1.66 | 0.378 | Neg. Moment |

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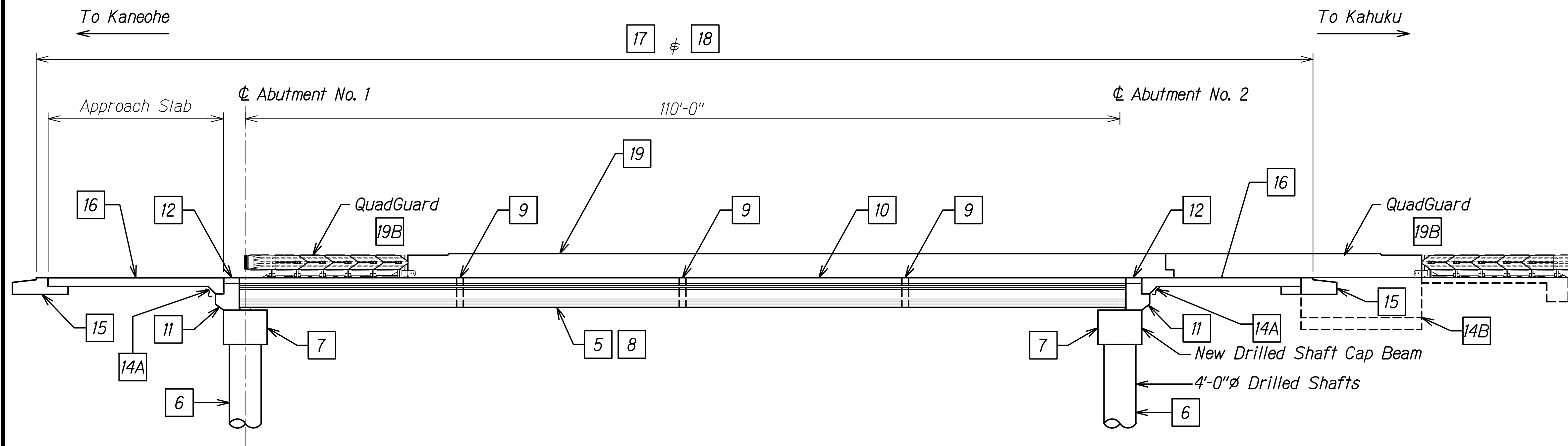
STRUCTURAL GENERAL NOTES

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: None Date: February 2021

SHEET No. **S06** OF 12 SHEETS

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CONSTRUCTION SEQUENCE NOTES:

- Order of construction sequence shall not be changed.
- Each sequence stage shall be completely finished before proceeding to the next stage unless otherwise noted. The Engineer will be the sole judge of whether the sequence stage is complete, and may direct the Contractor to stop work on a sequence stage to complete work on the preceding sequence stage.
- Contractor shall submit overweight vehicular details for approval prior to their use.

CONSTRUCTION SEQUENCE
Scale: 1/8" = 1'-0"

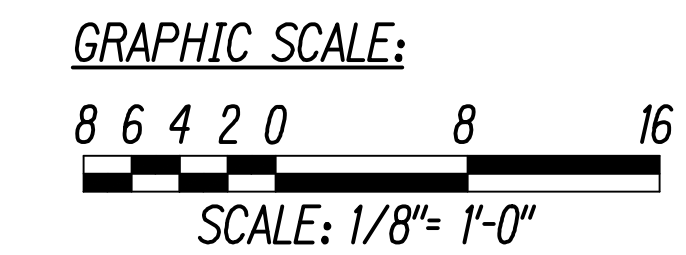
CONSTRUCTION SEQUENCE ELEVATION

LEGEND:

Phase 1 Stages

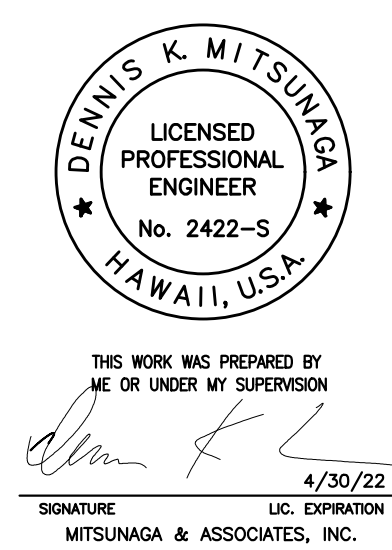
- 1 Relocate existing utility lines.
- 2 Construct trial and load test shafts. Perform load test.
- 3 Install detour road and temporary bridge.
- 4 Demolish existing bridge after obtaining demolition plan acceptance.
- 5 Construct precast girders. (May be done concurrently with Stages 1 through 4)
- 6 Construct 4 ft diameter drilled shafts. Shaft numbers 1, 2, 3, 5, 6, 7.
- 7 Cast Phase 1 drilled shaft cap beams, girder seats, and corbels for concrete encased ducts at least 7 days after the final drilled shaft concrete pour in Stage 6 or until the concrete in Stage 6 has attained a compressive strength of 4,500 psi, whichever occurs later.
- 8 Erect Phase 1 precast girders at least 15 days after the concrete pour in Stage 7 or until the concrete in Stage 7 has attained a compressive strength of 5,000 psi, whichever occurs later. Place slush grout immediately prior to placement of precast girders.
- 9 Construct Phase 1 diaphragm "A".
- 9A Set ducts and pour duct encasement in Bay 3.
- 10 Pour Phase 1 cast-in-place deck except areas over end beams a minimum of 24 hours after the concrete pour in Stage 9A.
- 11 Pour Phase 1 corbel and end beams to top of precast girder at least 30 days after the concrete pour in Stage 10. The concrete pour shall occur between midnight and 3:00 AM (3 hour window).
- 12 Pour remainder of Phase 1 deck concrete a minimum of 24 hours after the concrete pour in Stage 11.

- 13 Construct Phase 1 wing walls at least 8 days after the concrete pour in Stage 12 or after the concrete in Stage 12 has attained a compressive strength of 5,000 psi, whichever occurs later.
- 14A Backfill to Phase 1 limits and to bottom of approach slab at least 14 days after the concrete pour in Stage 13 or until the concrete in Stage 13 has attained a compressive strength of 5,000 psi, whichever occurs later. Maximum height difference of backfill between abutments shall not exceed 2 feet. Install concrete encased ducts behind abutments when backfill height is at the elevation of the bottom of the concrete encased electrical ducts. Continue backfilling after concrete for encased electrical ducts has attained its 28 day compressive strength.
- 14B Construct concrete barrier wall. (Coordinate construction of concrete barrier wall with stage 14A construction).
- 15 Construct Phase 1 sleeper slabs.
- 16 Construct Phase 1 approach slabs.
- 17 Blanket grind deck, approach slabs, and sleeper slabs where traffic will be allowed during construction of phase 2.
- 18 Mechanically groove deck, approach slabs, and sleeper slabs where traffic will be allowed during construction of phase 2.
- 19A Construct mauka aesthetic railing and concrete barrier.
- 19B Install mauka quadguards.
- 19C Install temporary barriers.



| | |
|---------------|------|
| ORIGINAL PLAN | DATE |
| REVISION | DATE |
| DESIGNED BY | |
| CHECKED BY | |
| NO. | |

DRAWING NAME: I:\PROJECTS\ACTIVE FILES\13-01_KAIPAPAU BRIDGE\REVISED_STRUCTURE\051221\KSB-5007.DWG PLOT TIME: 06-14-21 9:38 AM



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

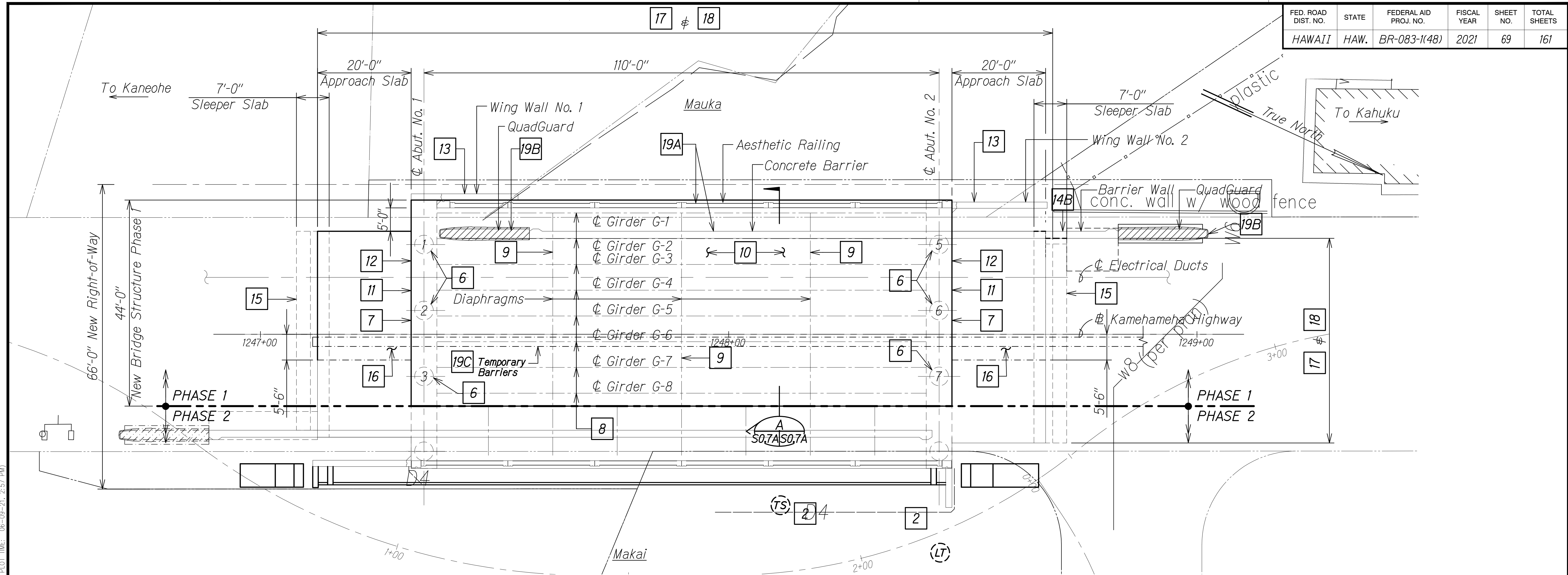
CONSTRUCTION SEQUENCE
PHASE 1

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

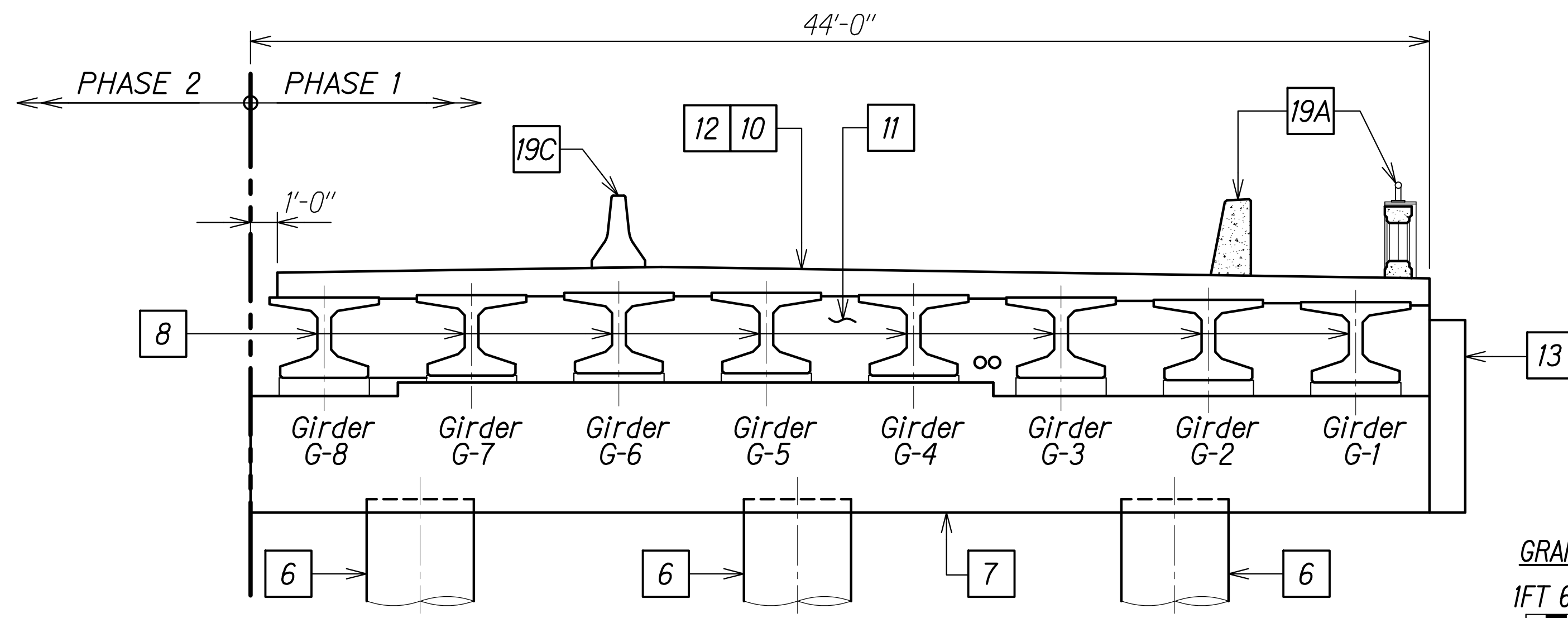
Scale: As Noted Date: February 2021

SHEET No. S07 OF 12 SHEETS

| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
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| HAWAII | HAW. | BR-083-1(48) | 2021 | 69 | 161 |

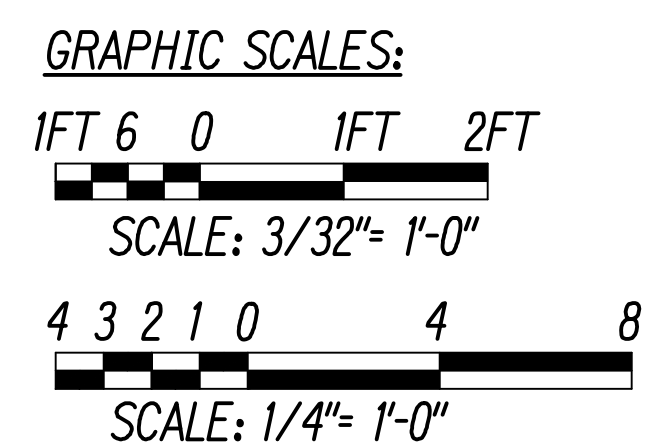


CONSTRUCTION SEQUENCE PLAN (PHASE 1)
Scale: 3/32" = 1'-0"



CONSTRUCTION SEQUENCE (PHASE 1)
Scale: 1/4" = 1'-0"

- LEGEND:**
- # Construction Sequence Stage
 - # Drilled Shaft ID
 - (TS) Trial Shaft
 - (LT) Load Test Shaft



DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
4/30/22
SIGNATURE LIC. EXPIRATION
MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONSTRUCTION SEQUENCE
PHASE 1

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S0.7A OF 12 SHEETS

| | |
|---------------|------|
| ORIGINAL PLAN | DATE |
| DESIGNED BY | |
| TRACED BY | |
| DESIGNED BY | |
| QUANTITIES BY | |
| CHECKED BY | |
| No. | |

DRAWING NAME: I:\PROJECTS\ACTIVE FILES\13-01_KAIPAPAU BRIDGE\REVISED_STRUCTURE\S0.7A SW FIXED_I7.DWG PLOT TIME: 06-09-21, 2:57 PM

KAIPAPAU STREAM BRIDGE REPLACEMENT – OVERALL CONSTRUCTION SEQUENCE

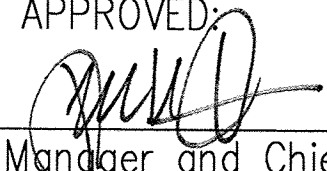
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| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 70 | 161 |

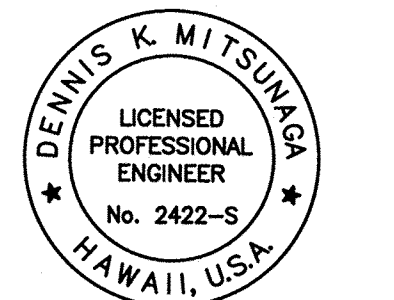
| Structural Construction Stage | Description | References | | | | Waterline Work | Exist Bridge Open | Detour Open | Detour Off Peak Lane Closures Anticipated | Remarks |
|---|---|---|----------------------|--|--|--|------------------------------|-------------|---|--|
| | | Civil | Electrical | Geotech. | Structural | | | | | |
| Prior to Site Mobilization for Demolition | 1. Prior to Site Mobilization, the Contractor shall submit required BMP's and other Municipal and National permit applications as indicated in the project Plans, Special Provisions and Specifications. 2. The Contractor shall submit Prefabricated Steel Beam Bridge Structural Computations and Erection drawings to the Owner for Review and Approval Prior to Fabrication. | Civil Sequence See C-11. See Civil [7] & Civil [3] | | | Structural Sequence S0.7, S0.7A, S0.8, S0.8A | | Exist Bridge Open to Traffic | | | |
| [1] | 1. Install approved BMP measures. 2. Relocate Existing overhead utility lines. | C-18, C-21 to C-23 | E-8, E-9, E-10, E-11 | | | | | | | |
| [2] | 1. Construct Trial and Load Test shafts * 2. Perform Load Test. Demobilize drilled shaft equipment off site. | See Civil [4] | | Special drilling equipment* | S1.1, S8.3 | | | | | Special *Provisions Section 511 |
| [3] | 1. Install Detour Pier, Abutments and Temporary Bridge. Construct Civil temporary 16" on temporary bridge C-32; C-31. 2. Construct Detour Approach Retaining Wall, Fills and Roadway – chainlink fence see C-24. 3. Open Detour to vehicles and pedestrians. Close existing bridge. 4. Install temporary 12" fusible PVC waterline on existing (upstream) pedestrian walkway and relocate 12" waterline C-21 to C-23. 5. Connect temporary 16" waterline to existing 16" waterline, see C-31; C-33. See remark | See Civil [5] C-21 to C-24, C-31 to C-33. See Civil (5A), (5B), & (5C). | E-10, E-11, E-15 | Excavation Bracing-Spec. Prov. 205* | S12.1, S12.2 S12.3, S12.4 S12.5 | Phase 1 (W16) then Phase 1, 2, & 3 (W12), then Phase 2 (W16) | Detour Open to Traffic | | | Connection of the temp. 16" waterline to the existing 16" waterline cannot begin until after the permanent 12" waterline has been pressure tested, accepted by BWS and placed into service and the temp. 12" waterline has been removed. |
| [4] | 1. Demolish existing bridge after obtaining demolition plan acceptance. 2. Demolish and remove portion of ex. 16" waterline and concrete support system as required to construct new bridge. See C-31, C-33. | C-16, C-31, C-33. See Civil [6] | | Excavation Bracing-Spec. Prov. 205* | S2.1, S2.2 | Phase 2 (W16) | Exist Bridge Demolition | | | *Exc. Bracing upstream of existing. |
| [5] | Construct precast girders. (May be done concurrently with stages 1 through 4.) | See Civil [7] | | | S4.x series | | | | | |
| [6] | Construct 4 ft. diameter drilled shafts. 1, 2, 3, 5, 6, 7. * | | | Special drilling equipment* | S1.1, S1.2, S6.1, S6.2, S8.1, S8.2 | | | | | *Special Provisions Section 511 |
| [7] | Cast phase 1 drilled shaft cap beams, girder seats, and corbels for concrete encased ducts at least 7 days after the final drilled shaft concrete pour in stage 6 or until the concrete in stage 6 has attained a compressive strength of 4,500 psi, whichever occurs later. | | | Structure - Excavation Bracing per Spec Prov 205 Required at Makai Limit | S0.7, S0.7A, S6.x series | | | | | Marks [7] through [18] are PHASE 1 Structural see [20] for PHASE 2 |
| [8] | Erect phase 1 precast girders at least 15 days after the concrete pour in stage 7 or until the concrete in stage 7 has attained a compressive strength of 5,000 psi, whichever occurs later. Place slush grout immediately prior to placement of precast girders. | | | | S0.7, S0.7A, S1.2, S1.3, S6.x series | | | | | |
| [9] | Construct phase 1 diaphragm "A". | | | | S0.7, S0.7A, S5.x series | | | | | |
| [9A] | Set ducts and pour duct encasement in Bay 3 | | | | S0.7, S0.7A S1.6, S3.x series | | | | | |
| [10] | Pour phase 1 cast-in-place deck except areas over end beams. | | | | S0.7, S0.7A, S6.x series | | | | | |
| [11] | Pour phase 1 end beams to top of precast girder and corbel at least 30 days after the concrete pour in Stage 10. The concrete pour shall occur between midnight and 3:00 AM (3 hours). | | | | | | | | | Concrete Placement At Night |
| [12] | Pour remainder of phase 1 deck concrete a minimum of 24 hours after the concrete pour in stage 11. | | | | | | | | | |
| [13] | Construct phase 1 wing walls at least 8 days after the concrete pour in stage 12 or after the concrete in stage 12 has attained a compressive strength of 5,000 psi, whichever occurs later. | | | | S0.7, S0.7A, S7.x series | | | | | Lane Closure Duration Approx 3 weeks each abutment with Further Lane Closure Duration Approx 2 weeks each approach |
| [14A] | Backfill to phase 1 limits and to bottom of approach slab and at least 14 days after the concrete pour in Stage 13 or until the concrete in Stage 13 has attained a compressive strength of 5,000 psi, whichever occurs later. Maximum height difference of backfill between abutments shall not exceed 2 feet. Install concrete encased ducts when backfill height is at the elevation of bottom of concrete encased ducts. Continue backfilling after concrete for encased ducts has attained its 28 day compressive strength. Construct Barrier Wall. (Coordinate with 14A.) | | | Signal Corps Work E-1, E-5 E-12, E-13, E-16 | S0.7, S0.7A, S6.x S9.x | | | | | |
| [14B] | | | | | | | | | | |
| [15] | Construct phase 1 sleeper slabs. | | | | | | | | | |
| [16] | Construct phase 1 approach slabs. | | | | | | | | | |
| [17] | Blanket grind deck, approach slabs, and sleeper slabs where traffic will be allowed during construction of phase 2. | | | | | | | | | |
| [18] | Mechanically groove deck, approach slabs and sleeper slabs where traffic will be allowed during construction of phase 2 | | | | | | | | | |
| [19A] | Construct mauka aesthetic railings and concrete barrier. | | | | | | | | | *Special Provisions Section 503 |
| [19B] | Install mauka quadguards. | | | | | | | | | |
| [19C] | Install Temporary Barriers and Temporary Striping on PHASE 1 of New Bridge. | See Civil for Barriers | | | | | | | | |

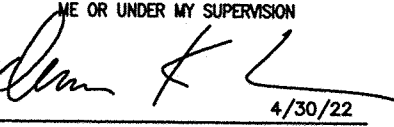
STRUCTURAL PHASE 1

SURVEY PLOTTED BY: DATE: _____
DRAWN BY: _____
DESIGNED BY: _____
QUANTITIES BY: _____
CHECKED BY: _____
No. _____

- CONSTRUCTION SEQUENCE NOTES:**
- Order of construction sequence shall not be changed unless authorized in writing by the Engineer.
 - Each sequence stage shall be completely finished before proceeding to the next stage unless otherwise noted. The Engineer will be the sole judge of whether the sequence stage is complete, and may direct the Contractor to stop work on a sequence stage to complete work on the preceding sequence stage.
 - Contractor shall submit overweight vehicular details for approval prior to their use.
 - Construction shall be conducted such that no construction debris, wash water or other contaminants shall enter the Stream Waters.
 - Closing of the Prefabricated Steel Beam Bridge Structure:
 - If for any reason or at any time, the Prefabricated Beam Bridge Structure's ability to safely carry traffic is in question, the Contractor shall be responsible for immediately taking the actions necessary to protect the public by closing, repairing and reopening the Prefabricated Steel Truss Bridge. When the Contractor closes the Prefabricated Steel Beam Bridge Structure, the Contractor shall immediately notify the Engineer and the appropriate Law Enforcement Agency.
 - Closing of the Prefabricated Steel Beam Bridge shall be included as incidental to Maintenance of Traffic Control.
 - The Contractor shall phase 16 inch waterline (W16) to allow no more than 8 hours of down time. Liquidated Damages of \$100,000 per day will be imposed if the Contractor exceeds the 8 hour restriction.

APPROVED:  MAY 24 2021
 Manager and Chief Engineer, BWS, (for work affecting BWS facilities State R/W & BWS easements only) DATE



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
 4/30/22
 SIGNATURE:  LIC. EXPIRES: _____
 MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

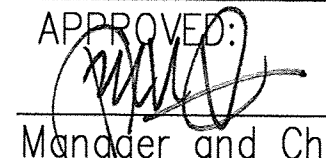
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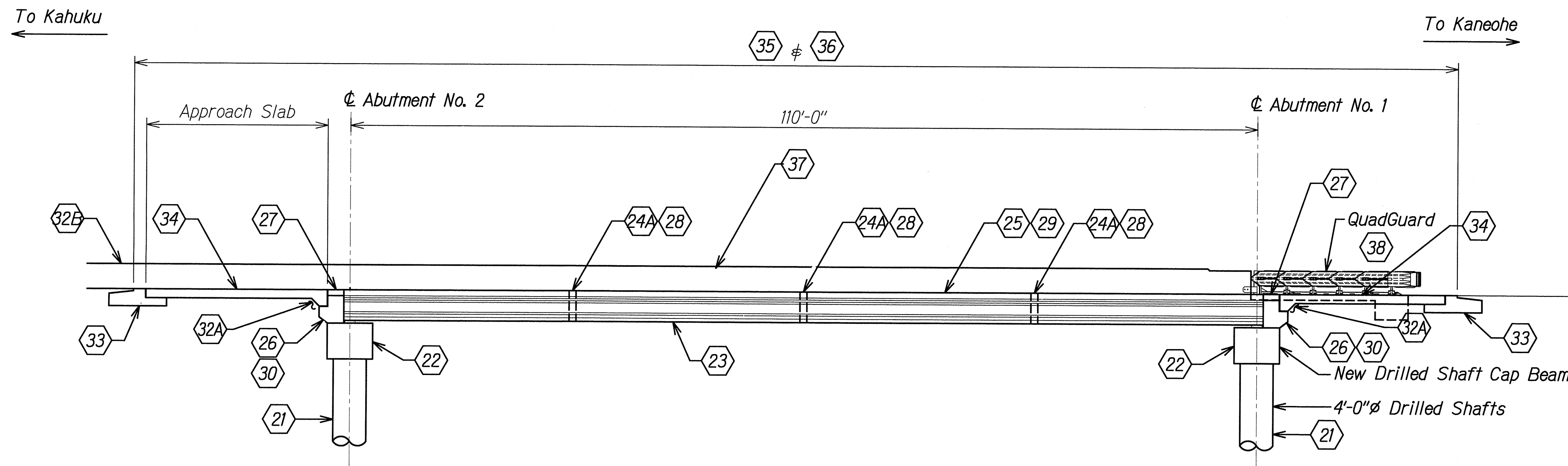
STRUCTURAL PHASE 1

KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021
 SHEET No. S0.7B OF 5 SHEETS

| | | | | | |
|---------------------|-------|-----------------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 71 | 161 |

APPROVED:  MAY 24 2021
 For: Manager and Chief Engineer, BWS (for work affecting BWS facilities State R/W & BWS easements only) DATE



CONSTRUCTION SEQUENCE
 Scale: 1/8" = 1'-0"

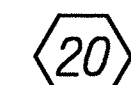
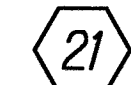

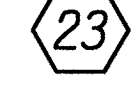



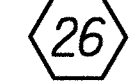

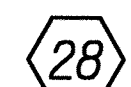
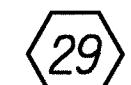
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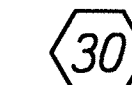
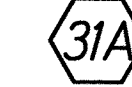

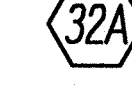
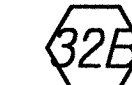

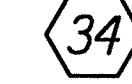
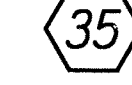
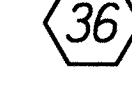
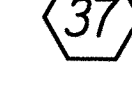
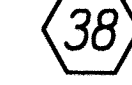
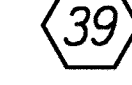
1. Order of construction sequence shall not be changed.
2. Each sequence stage shall be completely finished before proceeding to the next stage unless otherwise noted. The Engineer will be the sole judge of whether the sequence stage is complete, and may direct the Contractor to stop work on a sequence stage to complete work on the preceding sequence stage.
3. Contractor shall submit overweight vehicular details for approval prior to their use.

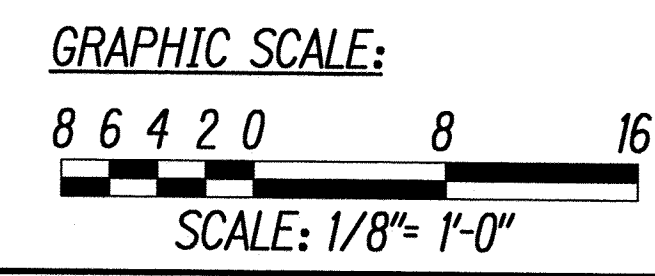
LEGEND:

 Phase 2 Stages

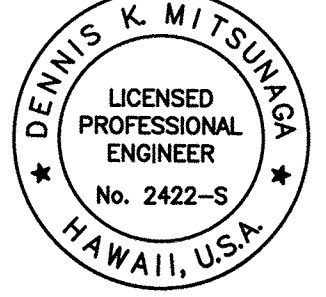
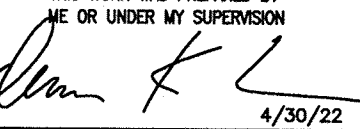
CONSTRUCTION SEQUENCE ELEVATION

-  Partially remove temporary bridge as required to construct Phase 2 of Kaipapau Stream Bridge
-  Construct 4 ft diameter shafts - Shaft nos. 4 and 8.
-  Cast Phase 2 drilled shaft cap beams and girder seats at least 7 days after the final drilled shaft concrete pour in Stage 21 or until the concrete in Stage 21 has attained a compressive strength of 4,500 psi, whichever occurs later.
-  Erect Phase 2 precast girders at least 15 days after the concrete pour in Stage 22 or until the concrete in Stage 22 has attained a compressive strength of 5,000 psi, whichever occurs later. Place slush grout immediately prior to placement of precast girders.
-  Construct Phase 2 diaphragms "A" and "B", except diaphragms between girders G-8 and G-9.
-  Construct waterline cradles.
-  Pour Phase 2 cast-in-place deck except areas over end beams and closure pour.
-  Pour Phase 2 corbel and end beams (except at closure pour) to top of precast girder at least 30 days after the concrete pour in Stage 25. The concrete pour shall occur between midnight and 3:00 AM (3 hour window).
-  Pour remainder of Phase 2 deck concrete (except at closure pour) a minimum of 24 hours after the concrete pour in Stage 26.
-  Pour Phase 2 diaphragm "A" between girders G-8 and G-9 at least 4 days after the concrete pour in Stage 27.
-  Pour Phase 2 cast-in-place deck closure except over end beams. Material for cast-in-place deck closure pour shall be VESLMC. (See Special Provisions).

-  Pour Phase 2 corbel and end beam closure from top of drilled shaft cap beam to top of deck. Material for end beam closure pour shall be VESLMC. (See Special Provisions).
-  Construct Phase 2 wing walls and return wall at least 8 days after the concrete pour in Stage 30 or after the concrete in Stage 30 has attained a compressive strength of 5,000 psi, whichever occurs later.
-  Install W16, W16 reaction blocks and W16 curtain wall.
-  Backfill to bottom of approach slab at least 14 days after the concrete pour in Stage 31A or until the concrete in stage 31A has attained a compressive strength of 5,000 psi, whichever occurs later. Maximum height difference of backfill between abutments shall not exceed 2 feet.
-  Construct Concrete Barrier Wall. (Coordinate construction of Concrete Barrier Wall with Stage 32A).
-  Construct Phase 2 sleeper slabs.
-  Construct Phase 2 approach slabs.
-  Blanket grind deck, approach slabs, and sleeper slabs.
-  Mechanically groove deck, approach slabs, and sleeper slabs.
-  Construct Makai aesthetic railing and concrete barrier.
-  Install Makai quadguards.
-  Remove remainder of temporary bridge.



| | |
|-------------------|------|
| SURVEY PLOTTED BY | DATE |
| DRAWN BY | |
| DESIGNED BY | |
| CHECKED BY | |
| NOTE BOOK | |
| No. | |

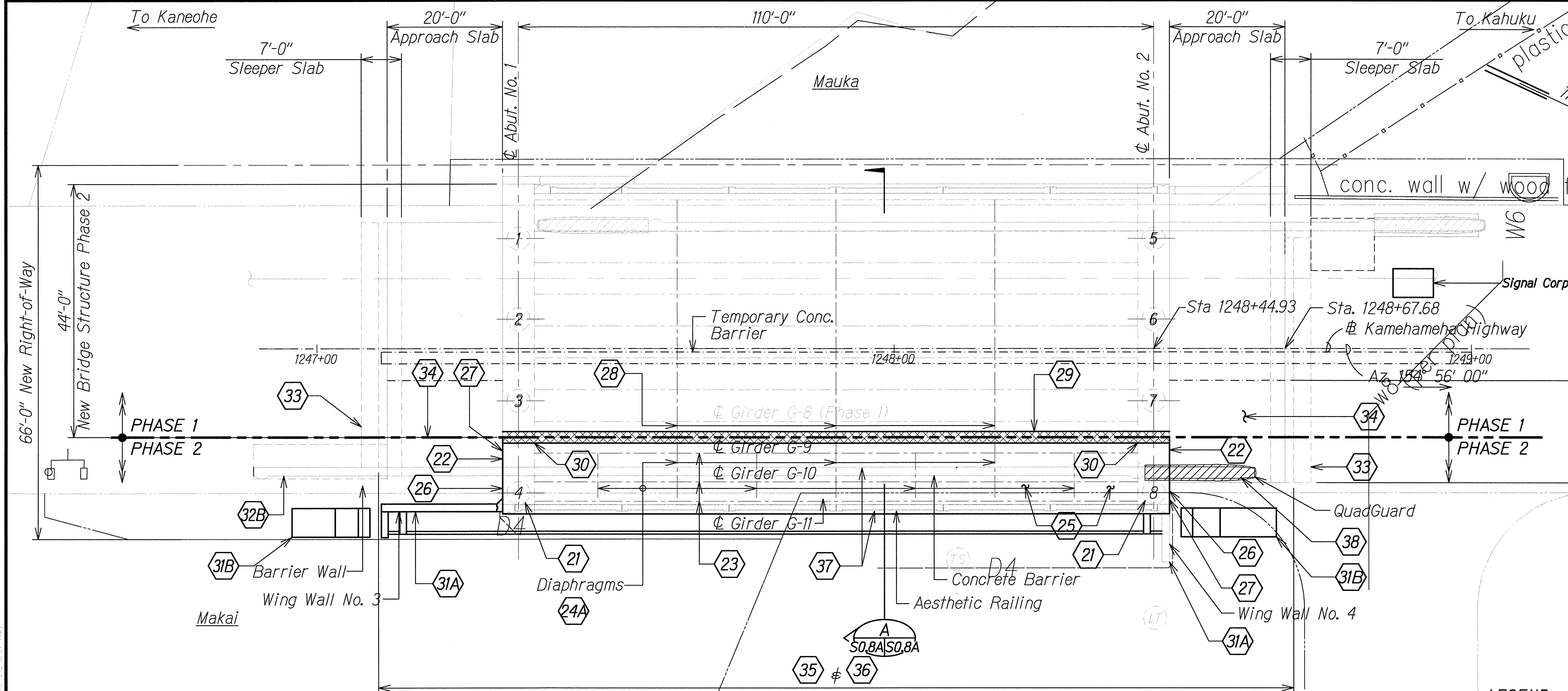

 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
 SIGNATURE:  LIC. EXPIRATION: 4/30/22
 MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

CONSTRUCTION SEQUENCE
PHASE 2
 KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)

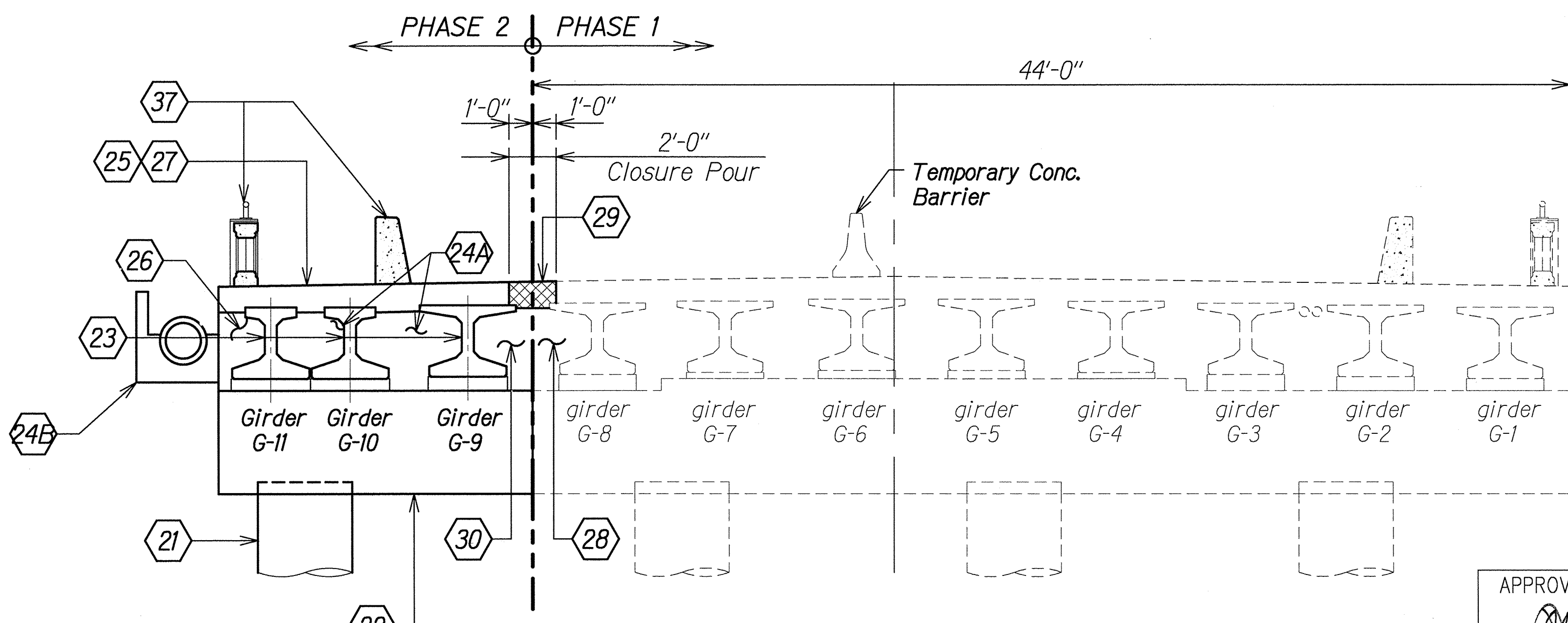
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 SHEET No. 508 OF 12 SHEETS

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| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 72 | 161 |

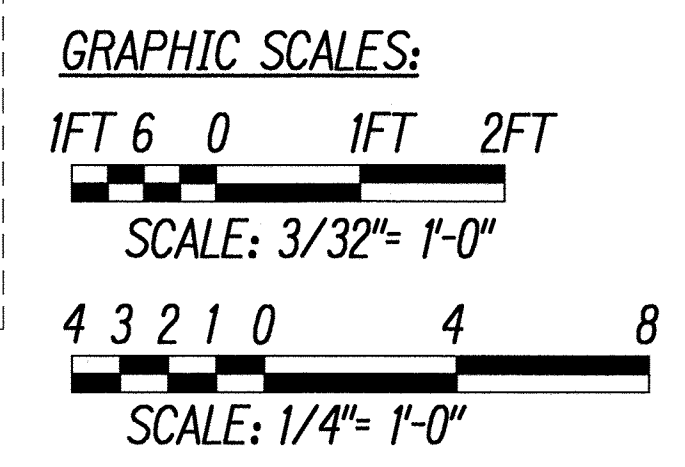


CONSTRUCTION SEQUENCE PLAN (PHASE 2)
Scale: 3/32" = 1'-0"

- LEGEND:**
- # Construction Sequence Stage
 - # Drilled Shaft ID
 - (TS) Trial Shaft
 - (LT) Load Test Shaft
 - ▨ Closure Pour



CONSTRUCTION SEQUENCE (PHASE 2)
Scale: 1/4" = 1'-0"



APPROVED: _____ DATE: MAY 24 2021
 Manager and Chief Engineer, BWS
 (for work affecting BWS facilities
 State R/W & BWS easements only)

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

**CONSTRUCTION SEQUENCE
 PHASE 2**

**KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)**

Scale: As Noted Date: February 2021
 SHEET No. S0.8A OF 12 SHEETS

DATE: _____
 SURVEY PLOTTED BY: _____
 DRAWN BY: _____
 CHECKED BY: _____
 ORIGINAL PLAN: _____
 NOTE BOOK: _____
 QUANTITIES BY: _____
 CHECKED BY: _____

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01 KAIPAPAU BRIDGE\33 REVISED_STRUCTURE\33-051221\KCB-50084.DWG PLOT TIME: 05-13-21, 8:07 AM

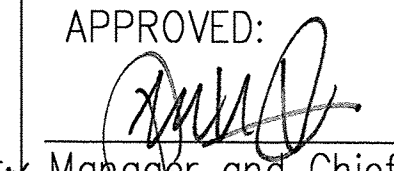
KAIPAPAU STREAM BRIDGE REPLACEMENT – OVERALL CONSTRUCTION SEQUENCE

| | | | | | |
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| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 73 | 161 |

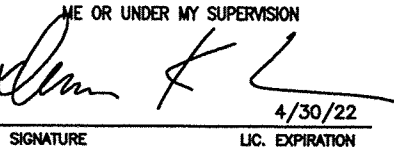
| Structural Construction Stage | Description | References | | | | Waterline Work | Exist Bridge Open | Detour Open | Detour Off Peak Lane Closures Anticipated | Remarks |
|-------------------------------|--|---------------------|------------|---|--------------------------------------|---|---|---|---|--|
| | | Civil | Electrical | Geotech. | Structural | | | | | |
| 20 | 1. Open PHASE 1 of New Bridge to traffic. Close Temporary Bridge and Detour Roadway to traffic. 2. Remove Mauka portion of Temporary Bridge Only (Remainder to remain in place to support construction equipment for construction of PHASE 2 portion of New Bridge and to support temporary W16 until Final W16 is constructed). | See Civil 8 | | | S0.8, S0.8A | | PHASE 1 of New Bridge Open to Traffic to allow Detour Closure | Close Detour and Remove Limited Portion of Temporary Bridge | Not Applicable | Close Detour; Open PHASE 1 of New Bridge; Start Construction of PHASE 2 of New Bridge |
| 21 | Construct 4 ft. diameter drilled shafts – Shaft nos. 4 and 8. | See Civil 8 | | Special drilling equipment* | ST.1, ST.2, S6.1, S6.2, S8.1, S8.2 | | | Detour Closed | | *Special Provisions Section 511 |
| 22 | Cast Phase 2 drilled shaft cap beams and girder seats at least 7 days after the final drilled shaft concrete pour in stage 21 or until the concrete in stage 21 has attained a compressive strength of 4,500 psi, whichever occurs later. | | | Structure Excavation Bracing per Spec for 205 Required at Approaches. | S0.8, S0.8A, S6.x series | | | | | Special Provisions Section 205 |
| 23 | Erect Phase 2 precast girders at least 15 days after the concrete pour in stage 22 or until the concrete in stage 22 has attained a compressive strength of 5,000 psi, whichever occurs later. Place slush grout immediately prior to placement of precast girders. | | | | S0.8, S0.8A, ST.2, ST.3, S6.x series | Civil Phase 3 (W16) waterline improvements see C-30, C.33 | | | | Connection of the temp. 16" waterline to the existing 16" waterline cannot begin until after the permanent 12" waterline has been pressure tested, accepted by BWS and placed into service and the temp. 12" waterline has been removed. |
| 24A | Construct Phase 2 diaphragms "A" and "B", except diaphragms between girders G-8 and G-9. | C-34 | | | S0.8, S0.8A, S5.x series | | | | | |
| 24B | Construct Waterline cradles | | | | | | | | | |
| 25 | Pour Phase 2 cast-in-place deck except areas over end beams and closure pour. | | | | S0.8, S0.8A, ST.6, S3.x series | | | | | |
| 26 | Pour Phase 2 end beams (except at closure pour) to top of precast girder and corbel at least 30 days after the concrete pour in Stage 25. The concrete pour shall occur between midnight and 3:00 AM (3 hours). | | | | S0.8, S0.8A, S6.x series | | | | | Concrete Placement At Night |
| 27 | Pour remainder of Phase 2 deck concrete (except at closure pour) a minimum of 24 hours after the concrete pour in stage 26. | | | | | | | | | |
| 28 | Pour Phase 2 diaphragm "A" between girders G-8 and G-9 at least 4 days after the concrete pour in stage 27. | | | | | | | | | |
| 29 | Pour Phase 2 cast-in-place deck closure except over end beams. Material for cast-in-place deck closure pour shall be VESLMC. | | | | | | | | | |
| 30 | Pour Phase 2 end beams closure from top of drilled shaft cap beam to top of deck. Material for end beam closure pour shall be VESLMC. | | | | | | | | | |
| 31A | Construct Phase 2 wing walls and return wall at least 8 days after the concrete pour in stage 30 or after the concrete in stage 30 has attained a compressive strength of 5,000 psi, whichever occurs later. | | | | S0.8, S0.8A, S7.x series | | | | | |
| 31B | Install W16, W16 reaction blocks and W16 curtain wall. | C-34 | | | | | | | | |
| 32A | Backfill to bottom of approach slab at least 14 days after the concrete pour in Stage 31A or until the concrete in Stage 31A has attained a compr. strength of 5,000 psi, whichever occurs later. Max. height difference of backfill between abutments shall not exceed 2 feet. Install jacketed waterline when backfill height is at the elevation of bot. of the jacketed waterline. Continue backfilling after concrete for jacketed waterline has attained its 28 day compr. strength. Construct Barrier Wall. | | | | S0.8, S0.8A, S6.x, S9.x | | | | | |
| 32B | | | | | | | | | | |
| 33 | Construct Phase 2 sleeper slabs. | | | | | | | | | |
| 34 | Construct Phase 2 approach slabs. | | | | | | | | | |
| 35 | Blanket grind deck, approach slabs and sleeper slabs | | | | | | | | | |
| 36 | Mechanically groove deck, approach slabs, and sleeper slabs | | | | | | | | | |
| 37 | Construct Makai aesthetic railings and concrete barrier. | | | | | | | | | |
| 38 | Install Makai guardrail. Remove Detour; construct stream hardening. Remove Temporary Barriers at New Bridge. Open Phase 1 and Phase 2 of New Bridge to traffic. | See Civil 8 thru 12 | | Permanent Electrical Plan See E-12, E-13, E-14 | | | Remove temp W16 at Closed Detour | PHASE 1 and PHASE 2 of New Bridge Open | Remove Remainder of Detour | |

- CONSTRUCTION SEQUENCE NOTES:**
- Order of construction sequence shall not be changed unless authorized in writing by the Engineer.
 - Each sequence stage shall be completely finished before proceeding to the next stage unless otherwise noted. The Engineer will be the sole judge of whether the sequence stage is complete, and may direct the Contractor to stop work on a sequence stage to complete work on the preceding sequence stage.
 - Contractor shall submit overweight vehicular details for approval prior to their use.
 - Construction shall be conducted such that no construction debris, wash water or other contaminants shall enter the Stream Waters.
 - Closing of the Prefabricated Steel Beam Bridge Structure:
 - If for any reason or at any time, the Prefabricated Beam Bridge Structure's ability to safely carry traffic is in question, the Contractor shall be responsible for immediately taking the actions necessary to protect the public by closing, repairing and reopening the Prefabricated Steel Truss Bridge.
 - When the Contractor closes the Prefabricated Steel Beam Bridge Structure, the Contractor shall immediately notify the Engineer and the appropriate Law Enforcement Agency.
 - Closing of the Prefabricated Steel Beam Bridge shall be included as incidental to Maintenance of Traffic Control.

The Contractor shall phase 16 inch waterline (W16) to allow no more than 8 hours of down time. Liquidated Damages of \$100,000 per day will be imposed if the Contractor exceeds the 8 hour restriction.

APPROVED:  MAY 2 4 2021
 Manager and Chief Engineer, BWS, (for work affecting BWS facilities State R/W & BWS easements only) DATE



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
 SIGNATURE:  DATE: 4/30/22
 MITSUNAGA & ASSOCIATES, INC. LIC. EXPIRATION

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

OVERALL CONSTRUCTION SEQUENCE

STRUCTURAL PHASE 2

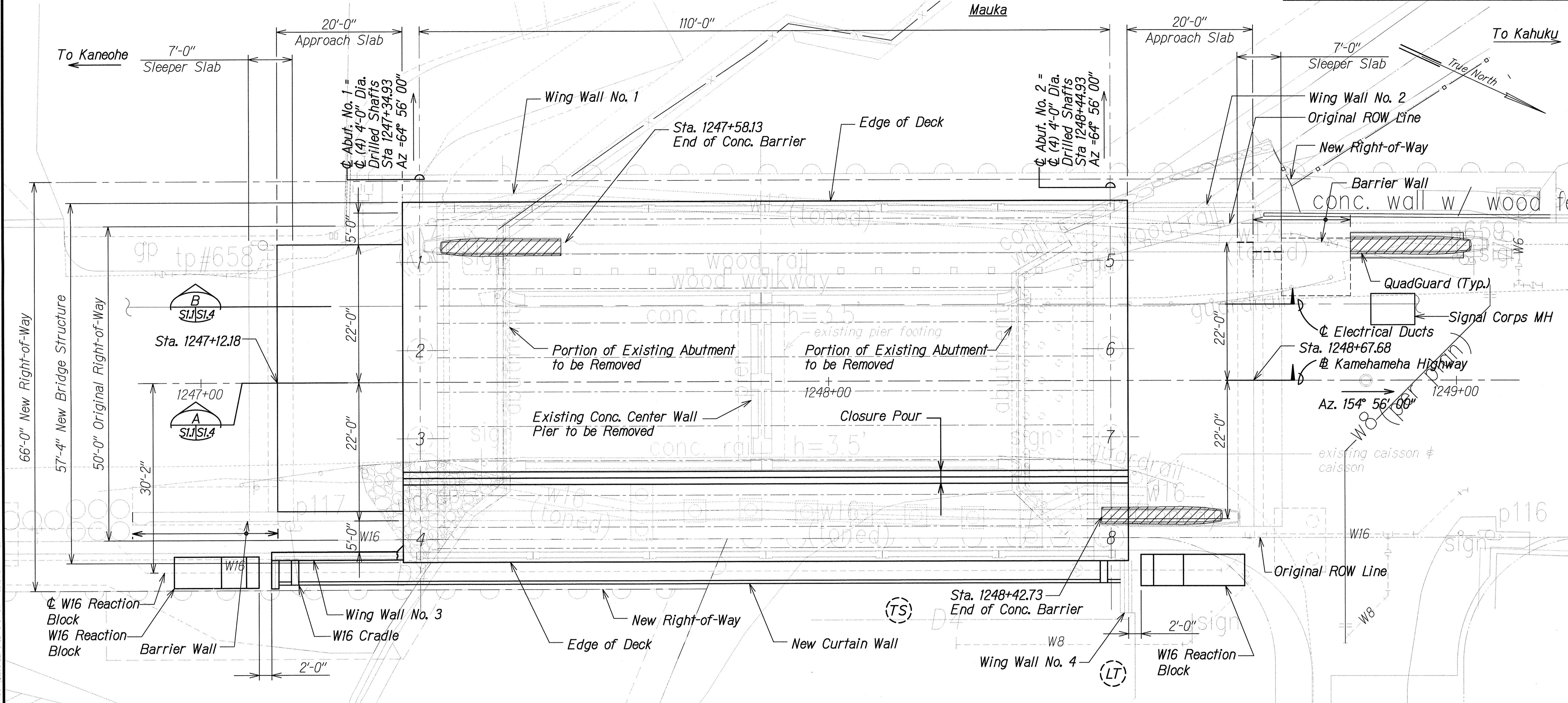
KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021
 SHEET No. S0.8B OF 5 SHEETS

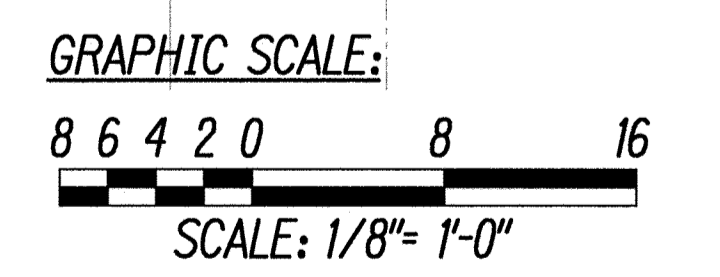
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 SURVEY PLOTTED BY _____ DATE _____
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 CHECKED BY _____
 DESIGNED BY _____
 QUANTITIES BY _____

STRUCTURAL PHASE 2

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| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 74 | 161 |



LAYOUT PLAN
Scale: 1/8" = 1'-0"



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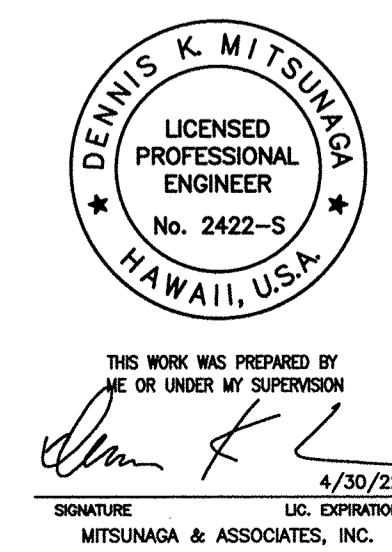
LEGEND:

- (#) Drilled Shaft ID
- (TS) Trial Shaft
- (LT) Load Test Shaft

Note:

Balance of W16 cradles are not shown for clarity. See sheet S11.1 and S11.1A for details.

APPROVED: *[Signature]* MAY 24 2021
DATE
Manager and Chief Engineer, BWS (for work affecting BWS facilities State R/W & BWS easements only)



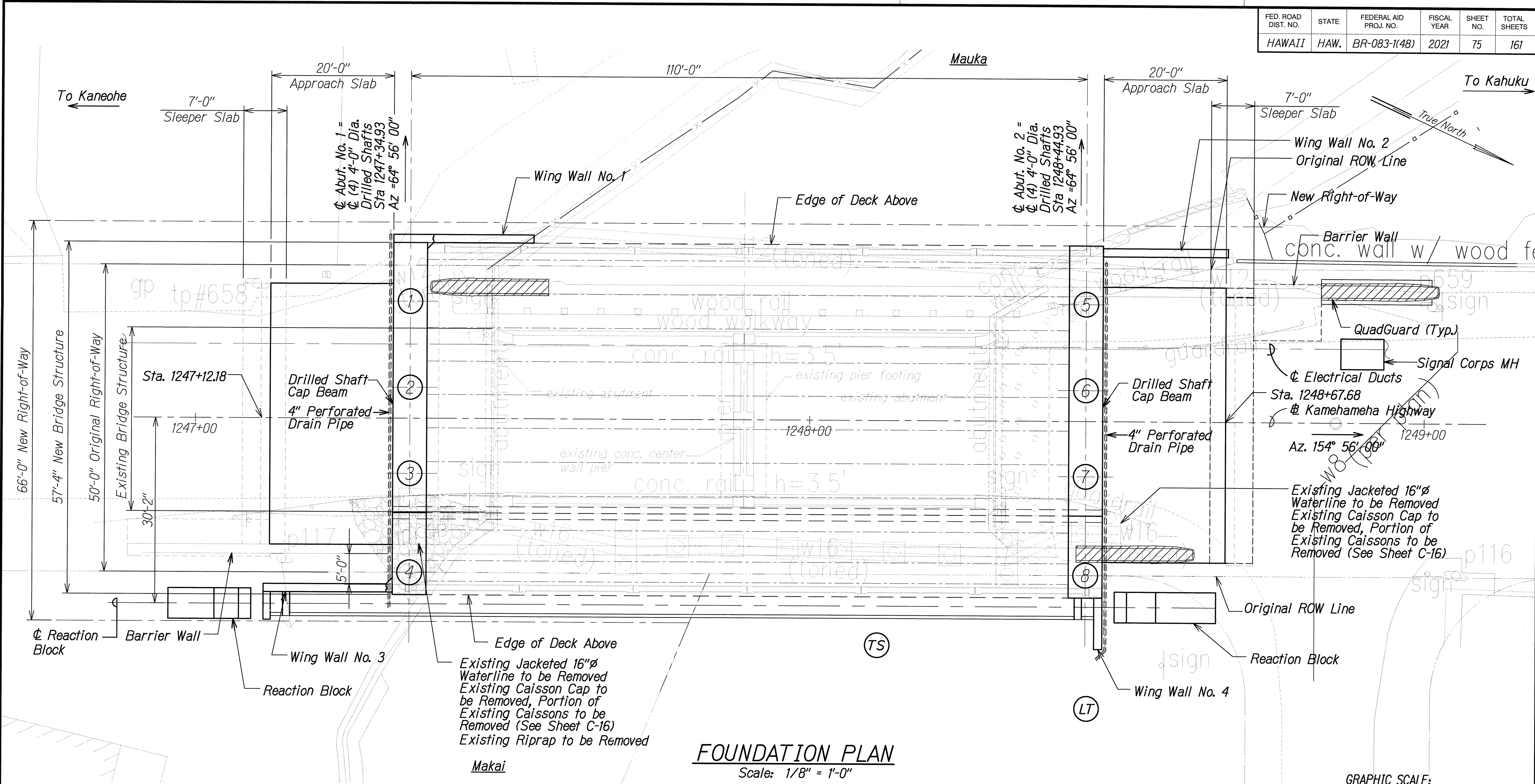
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LAYOUT PLAN

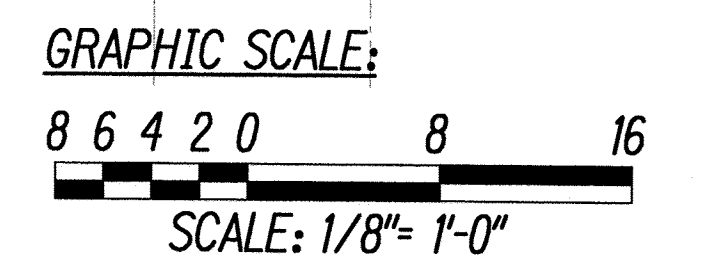
KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021
SHEET No. S11 OF 6 SHEETS

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| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 75 | 161 |



FOUNDATION PLAN
Scale: 1/8" = 1'-0"



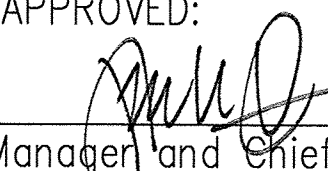
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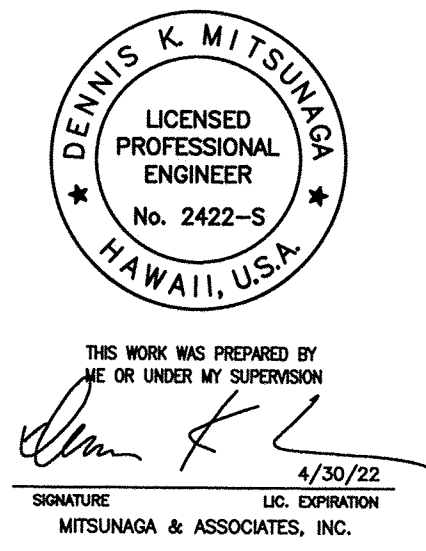
- (#) Drilled Shaft ID
- (TS) Trial Shaft
- (LT) Load Test Shaft

References:

1. See Sheet S6.1 for Abutment No. 1 Plan.
2. See Sheet S6.2 for Abutment No. 2 Plan.
3. See Sheets S8.1 through S8.3 for Drilled Shaft Details (Including Load Test Shaft)

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APPROVED:  DATE: MAY 24 2021
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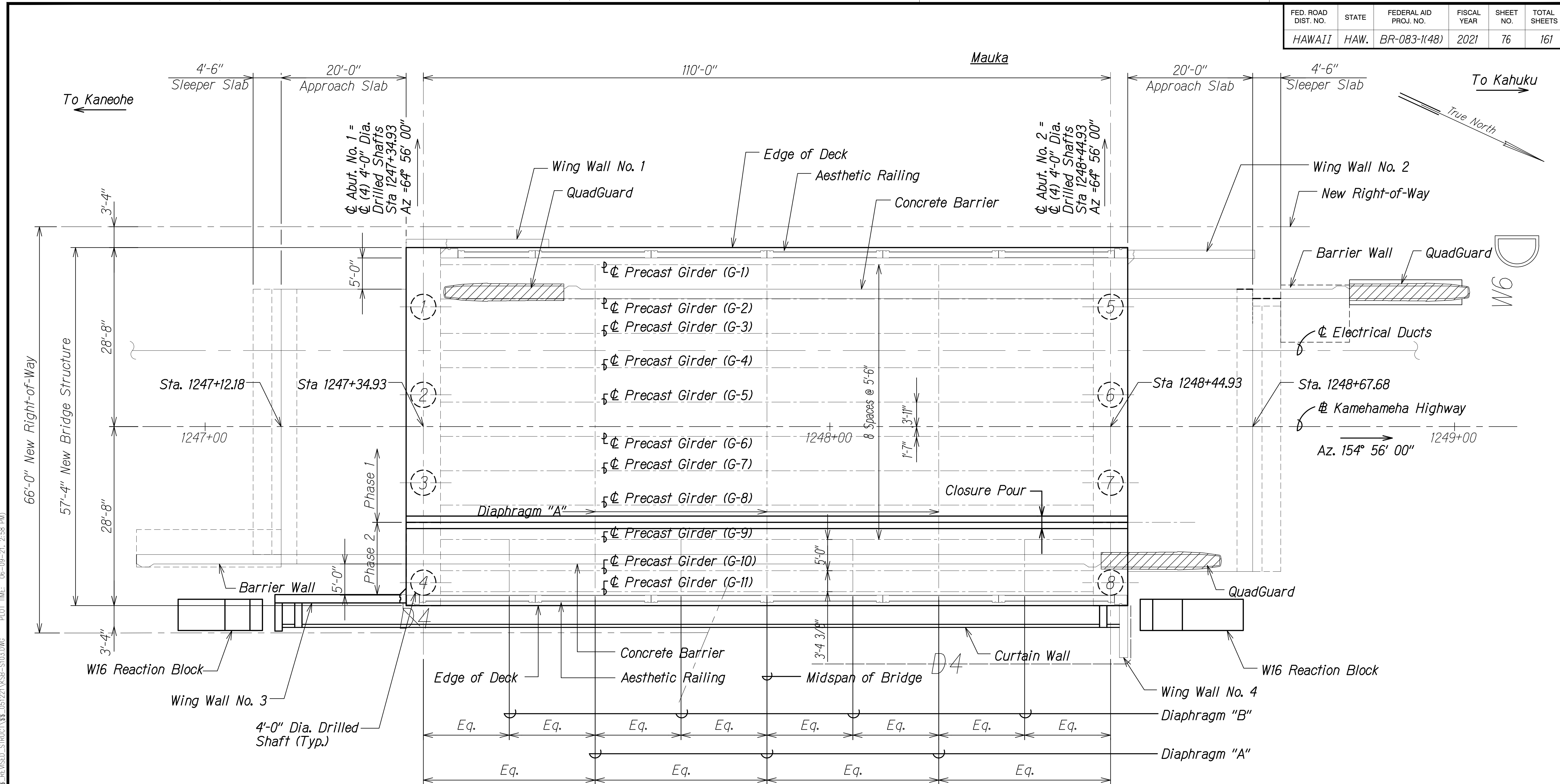
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

FOUNDATION PLAN

**KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)**

Scale: As Noted Date: February 2021
SHEET No. S12 OF 6 SHEETS

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| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 76 | 161 |



DECK FRAMING PLAN

Scale: 1/8" = 1'-0"

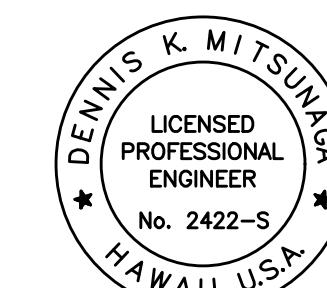
LEGEND:

(#) Drilled Shaft ID

References:

1. See Sheets S4.1 through S4.5 for Precast Girder Details.
2. See Sheets S5.1 through S5.2 for Diaphragm Details.
3. W16 Cradles are not shown for clarity. See Sheet S11.1 for Details.

GRAPHIC SCALE:



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
 SIGNATURE: *[Signature]* LIC. EXPIRATION: 4/30/22
 MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

DECK FRAMING PLAN

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

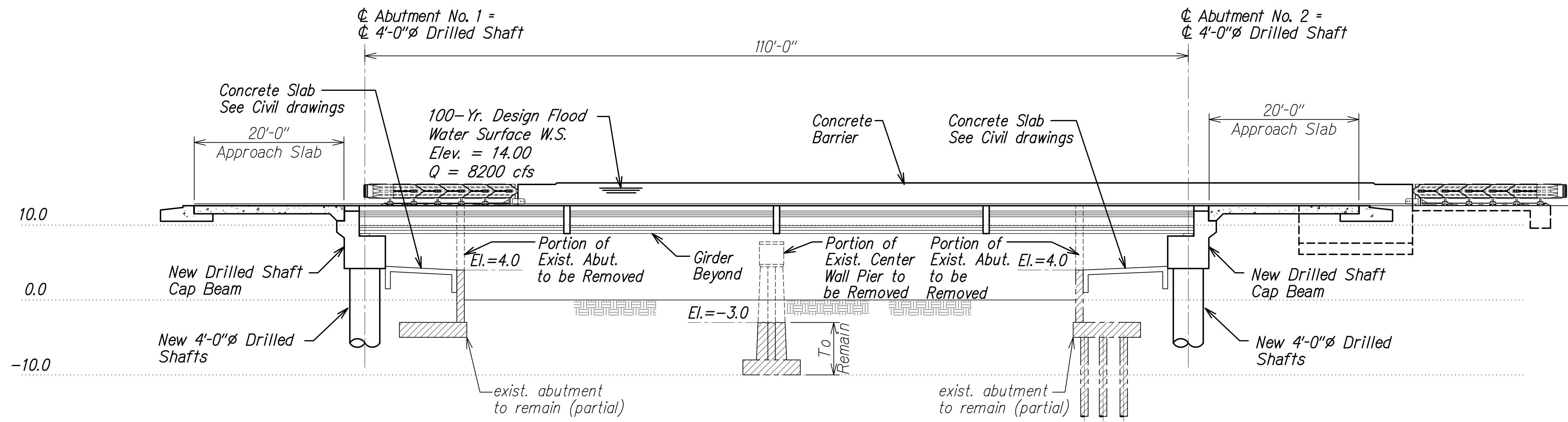
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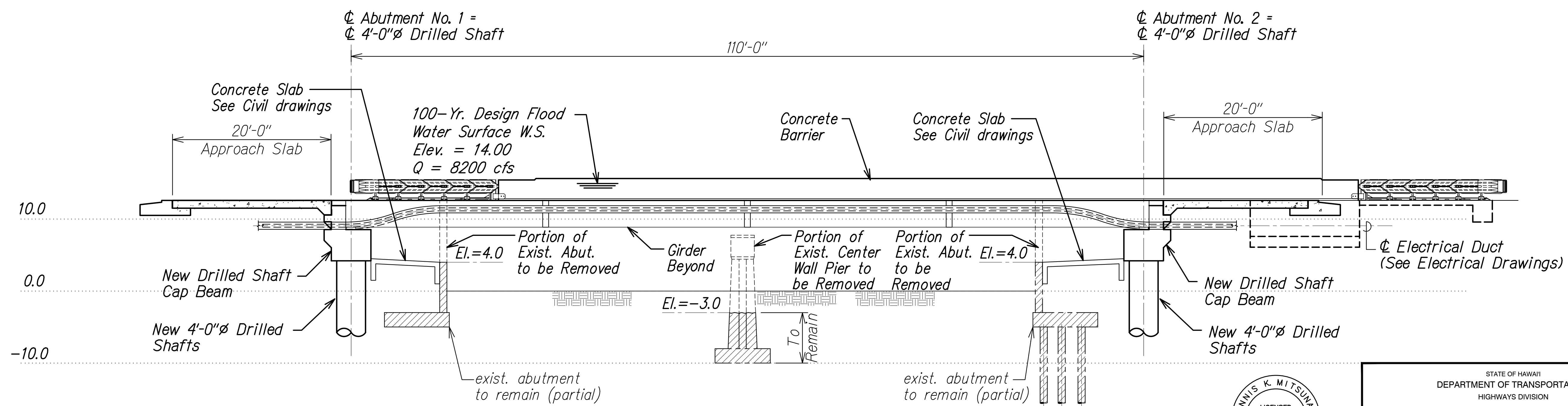
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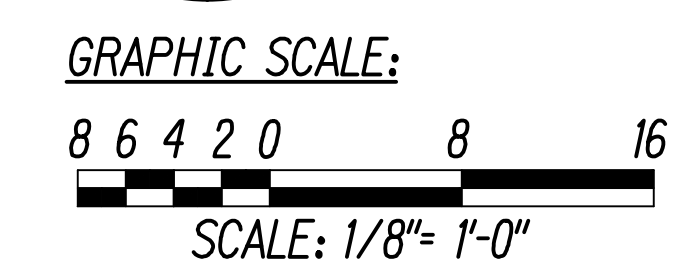
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| HAWAII | HAW. | BR-083-1(48) | 2021 | 77 | 161 |



LONGITUDINAL SECTION AT BASELINE A
 Scale: 1/8" = 1'-0" SI.1 | SI.4



LONGITUDINAL SECTION AT ELECTRICAL DUCTS B
 Scale: 1/8" = 1'-0" SI.1 | SI.4



DENNIS K. MITSUNAGA
 LICENSED PROFESSIONAL ENGINEER
 No. 2422-S
 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
 SIGNATURE: *[Signature]* LIC. EXPIRATION: 4/30/22
 MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

LONGITUDINAL SECTION

**KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)**

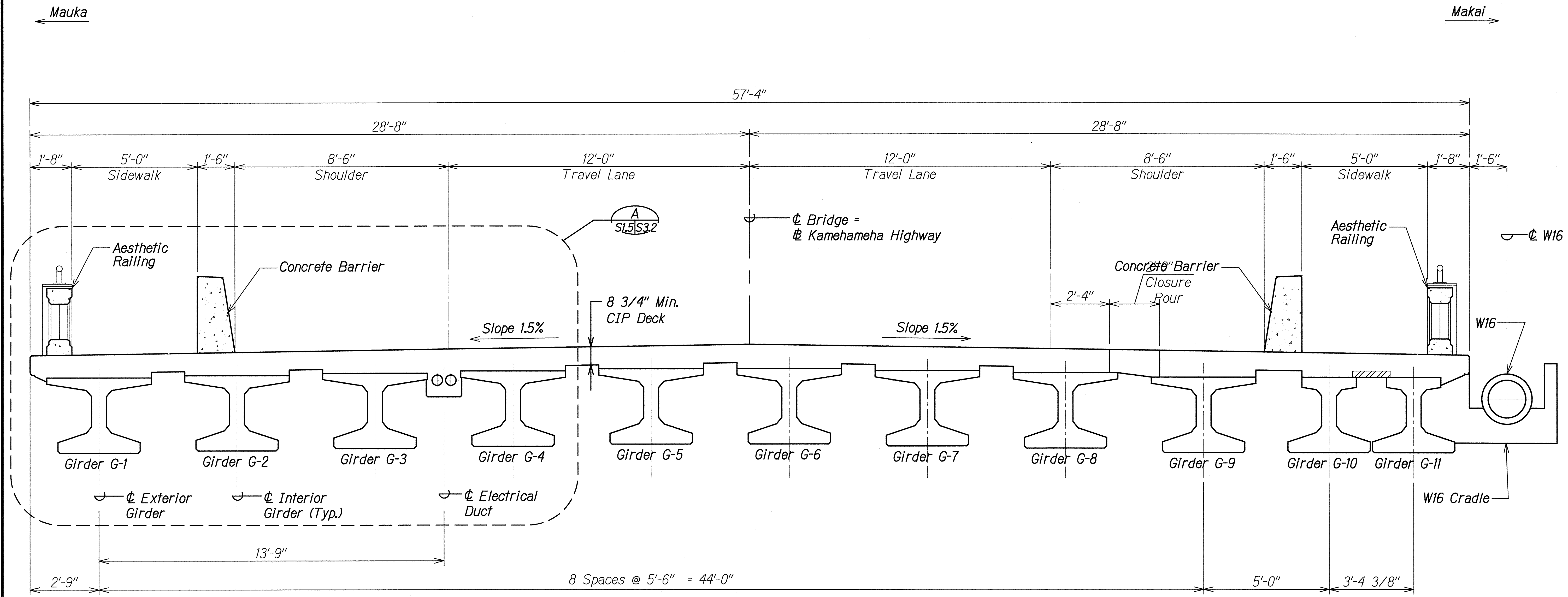
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SHEET No. **SI.4** OF 6 SHEETS

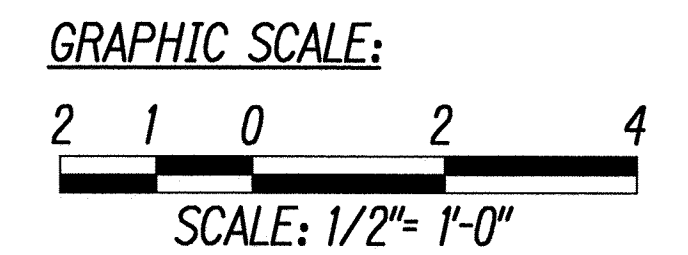
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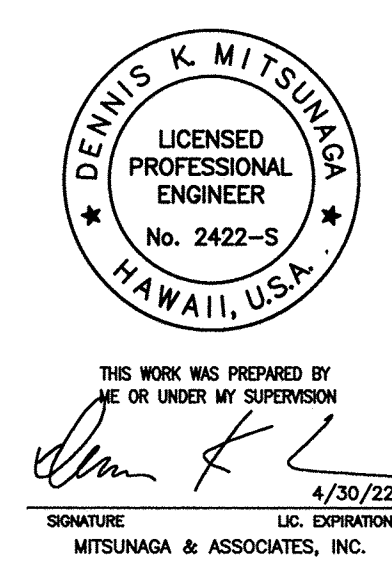
TYPICAL SECTION A
 Scale: 1/2" = 1'-0"



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| QUANTITIES BY | |
| NO. | |

APPROVED:

 Manager and Chief Engineer, BWS
 (for work affecting BWS facilities
 State R/W & BWS easements only)
 DATE: MAY 24 2021



STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

TYPICAL SECTION

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S15 OF 6 SHEETS

| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
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| HAWAII | HAW. | BR-083-1(48) | 2021 | 80 | 161 |

Notes to Demolition Plan:

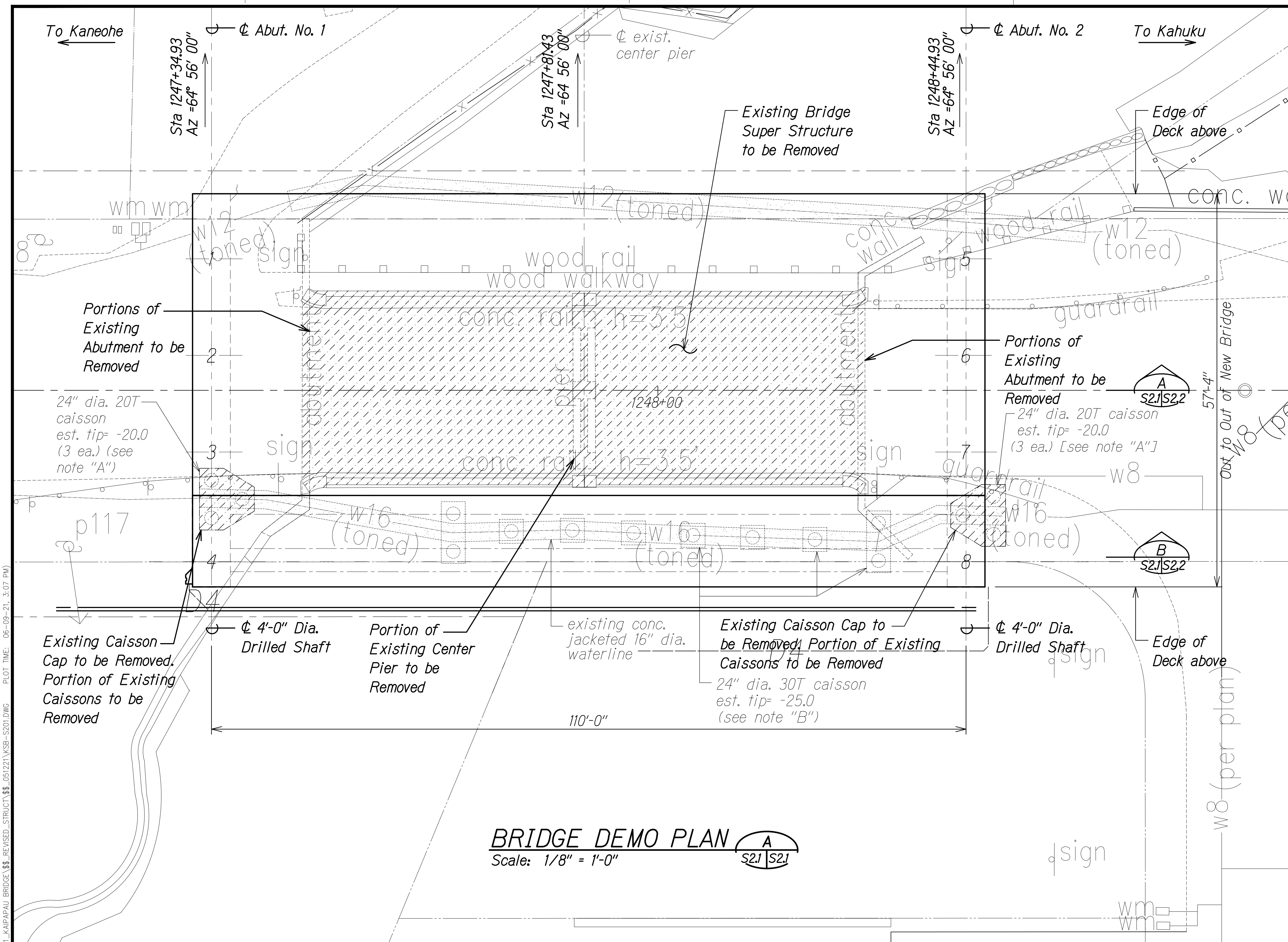
1. Structure backfill after removal shall comply with Special Provisions Section 205 and shall be incidental to Removal of Existing Concrete Bridge.
2. Removal of Existing End Posts and End Post Footings shall be incidental to Removal of Existing Concrete Bridge.
3. Explosive blasting is prohibited.
4. Demolition work shall comply with the specifications, Special Provision Section 202; AASHTO Guide Design Specification for Bridge Temporary Works and AASHTO Construction Handbook for Bridge Temporary Works; including all subsequent interim revisions. The most stringent requirements shall govern.
5. The Demolition work shall:
 - a. Facilitate Removal of Existing Concrete Bridge and Drilled Shaft Work.
 - b. Promote/ensure Best Management Practices Required for Construction.
 - c. Be incidental to Removal of Existing Concrete Bridge.

Note "A"

24" dia. 20T Caisson estimated to be embedded 5 ft. into mudrock. Approx. Tip Elev. = -20.0

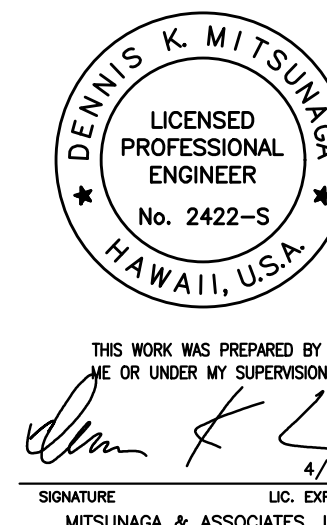
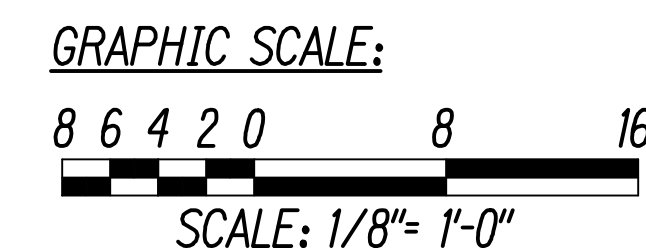
Note "B"

24" dia. 30T Caisson estimated to be embedded 10 ft. into hardrock. Approx. Tip Elev. = -25.0



BRIDGE DEMO PLAN A
 Scale: 1/8" = 1'-0" S21 | S21

Note:
 Load test shaft and trial shaft not shown for clarity.



STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

**EXISTING BRIDGE
 DEMOLITION PLAN**

**KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)**

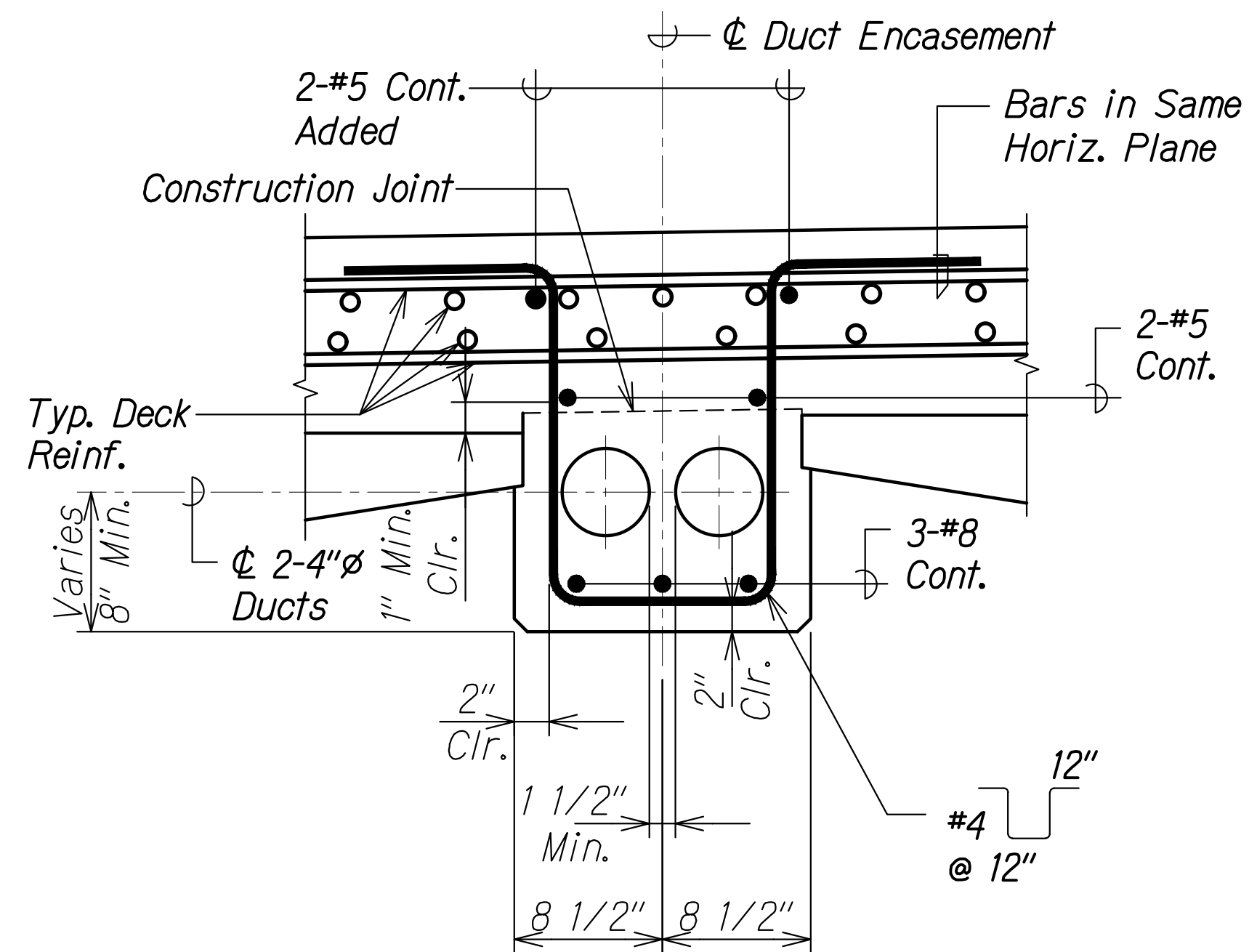
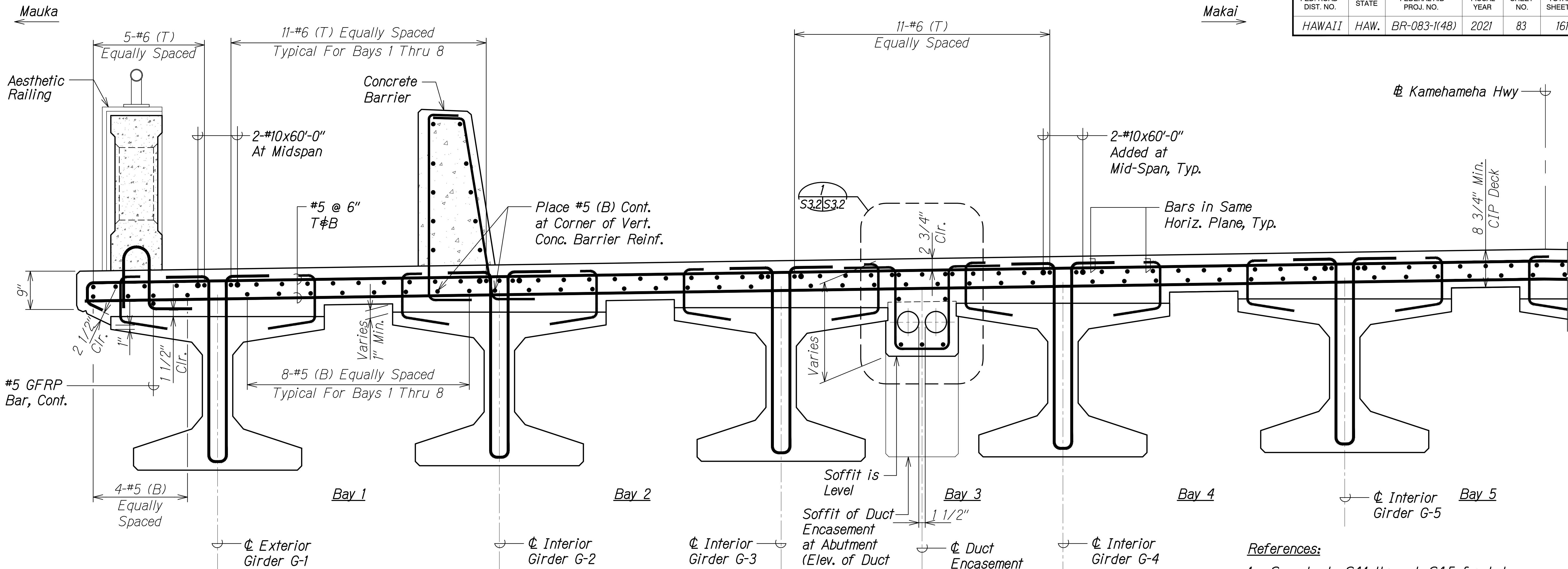
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SHEET No. S21 OF 2 SHEETS

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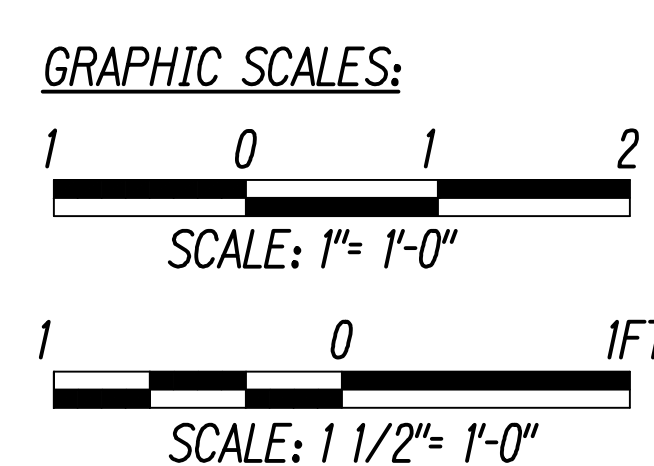
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| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 83 | 161 |



SECTION NEAR MIDSPAN A
Scale: 1" = 1'-0"

- References:**
1. See sheets S4.1 through S4.5 for balance of prestressed girder details.
 2. See sheets S10.3 through S10.5 for aesthetic railing details.
 3. See section B/S9.1 for concrete barrier details.
 4. See sheet S10.2 for joints in concrete barrier.



DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
SIGNATURE: *[Signature]* LIC. EXPIRATION: 4/30/22
MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PARTIAL DECK AND DUCT ENCASEMENT DETAIL

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

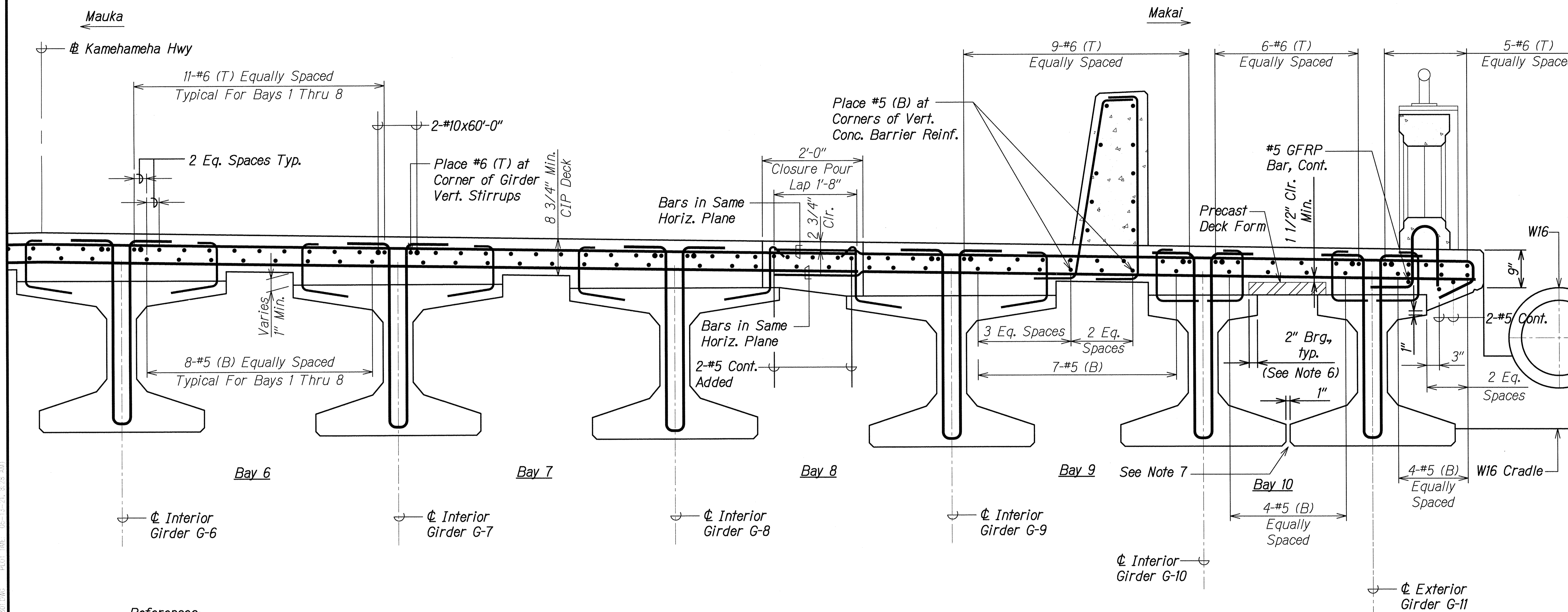
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SHEET No. S32 OF 7 SHEETS

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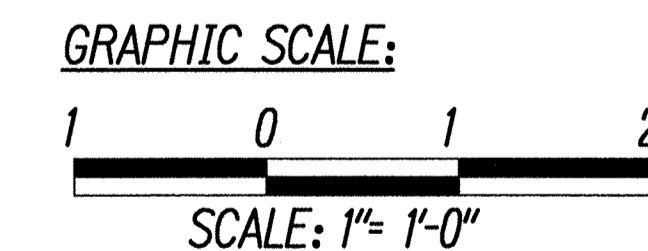
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| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 84 | 161 |



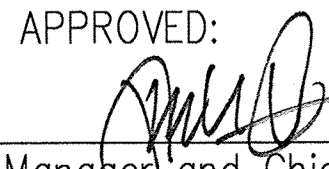
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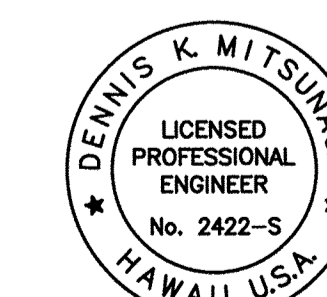
1. See sheets S4.1 through S4.5 for balance of prestressed girder details.
2. See sheets S10.3 through S10.5 for aesthetic railing details.
3. See section B/S9.1 for concrete barrier details.
4. See sheet S10.2 for joints in concrete barrier.
5. See sheet S11.1 for W16 cradle.
6. Precast deck forms shall be supported on a continuous, 1/4" minimum thick, non-shrink grout bed.
7. Fill 1" gap with non-shrink grout over a length of 1'-6" centered on W16 cradle. Fill gap prior to pouring cradle.

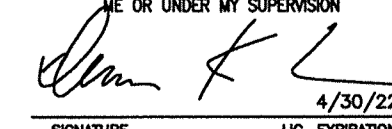
SECTION NEAR MIDSPAN A
 Scale: 1" = 1'-0"



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| ORIGINAL PLAN | SURVEY PLOTTED BY | DATE |
| NOTE BOOK | DRAWN BY | |
| | DESIGNED BY | |
| | QUANTITIES BY | |
| | CHECKED BY | |

APPROVED:  MAY 24 2021
 Manager and Chief Engineer, BWS (for work affecting BWS facilities State R/W & BWS easements only)



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STATE OF HAWAII
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 HIGHWAYS DIVISION

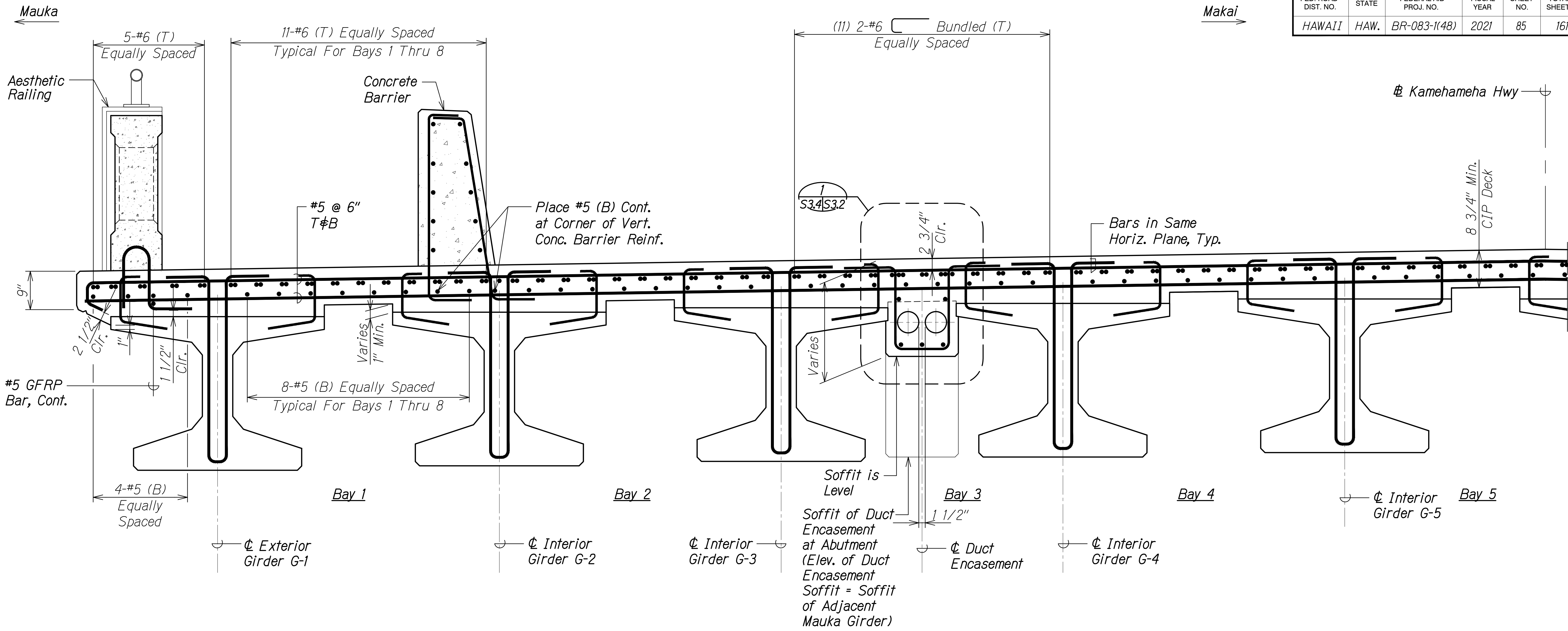
PARTIAL DECK SECTION

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

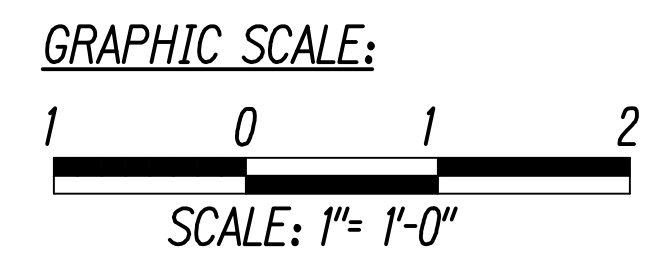
SHEET No. S33 OF 7 SHEETS

| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-----------------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 85 | 161 |



SECTION NEAR ABUTMENT A
 Scale: 1" = 1'-0"

- References:**
1. See sheets S4.1 through S4.5 for balance of prestressed girder details.
 2. See sheets S10.3 through S10.5 for aesthetic railing details.
 3. See section B/S9.1 for concrete barrier details.
 4. See sheet S10.2 for joints in concrete barrier.



DENNIS K. MITSUNAGA
 LICENSED PROFESSIONAL ENGINEER
 No. 2422-S
 HAWAII, U.S.A.

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STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

PARTIAL DECK SECTION

**KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)**

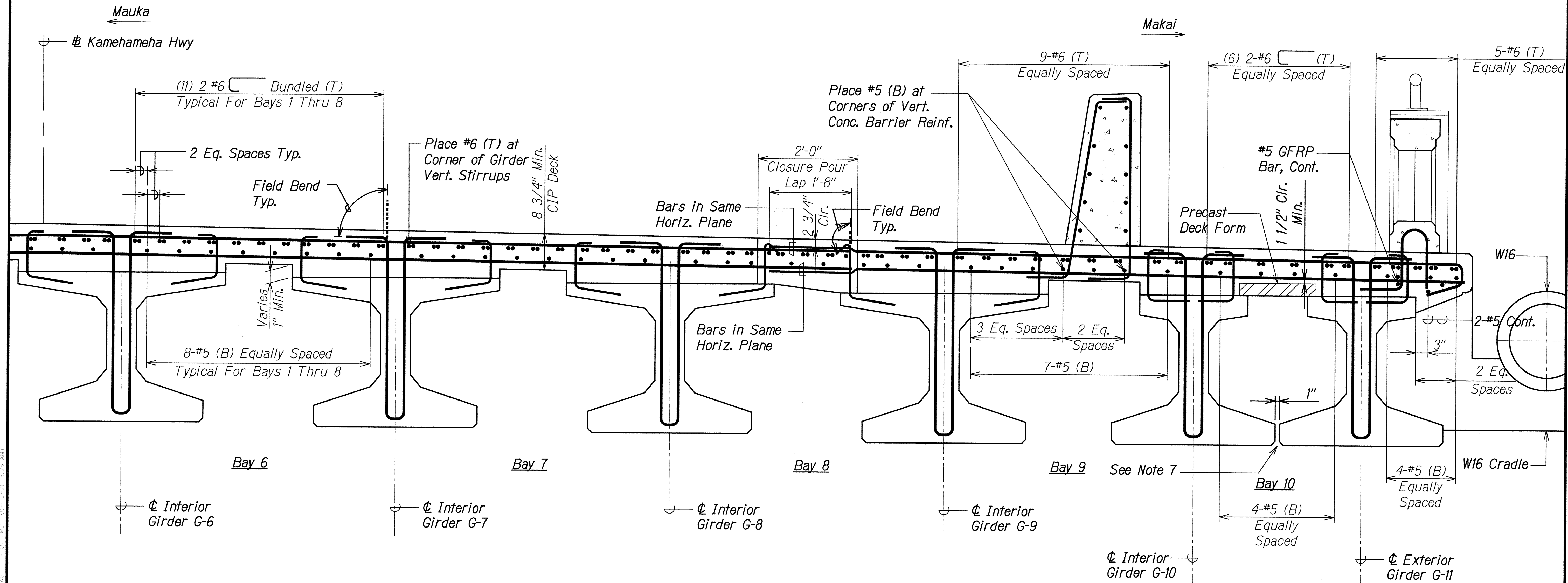
Scale: As Noted Date: February 2021

SHEET No. S34 OF 7 SHEETS

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| ORIGINAL PLAN | DATE |
| DESIGNED BY | |
| CHECKED BY | |
| NO. _____ | |

DRAWING NAME: T:\PROJECTS\ACTIVE FILES\13-01_KAIPAPAU BRIDGE\REVISED_STRUCT\13-051221\KSB-S301.DWG PLOT TIME: 09-09-21 3:10 PM

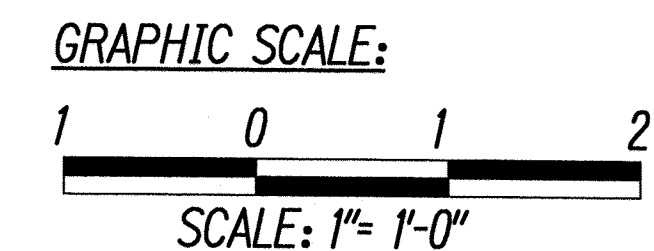
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| HAWAII | HAW. | BR-083-1(48) | 2021 | 86 | 161 |



References:


1. See sheets S4.1 through S4.5 for balance of prestressed girder details.
2. See sheets S10.3 through S10.5 for aesthetic railing details.
3. See section B/S9.1 for concrete barrier details.
4. See sheet S10.2 for joints in concrete barrier.
5. See sheet S11.1 for W16 cradle.
6. Precast deck forms shall be supported on a continuous, 1/4" minimum thick, non-shrink grout bed.
7. Fill 1" gap with non-shrink grout over a length of 1'-6" centered on W16 cradle.
8. Fill gap prior to pouring cradle.

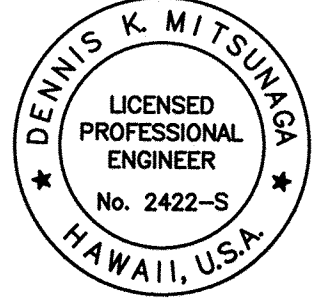
SECTION NEAR ABUTMENT A
 Scale: 1" = 1'-0"



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| ORIGINAL PLAN | DATE |
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| DESIGNED BY | |
| CHECKED BY | |
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APPROVED:  MAY 24 2021
 Manager and Chief Engineer, BWS DATE
 (for work affecting BWS facilities State R/W & BWS easements only)


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 MITSUNAGA & ASSOCIATES, INC.

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 HIGHWAYS DIVISION

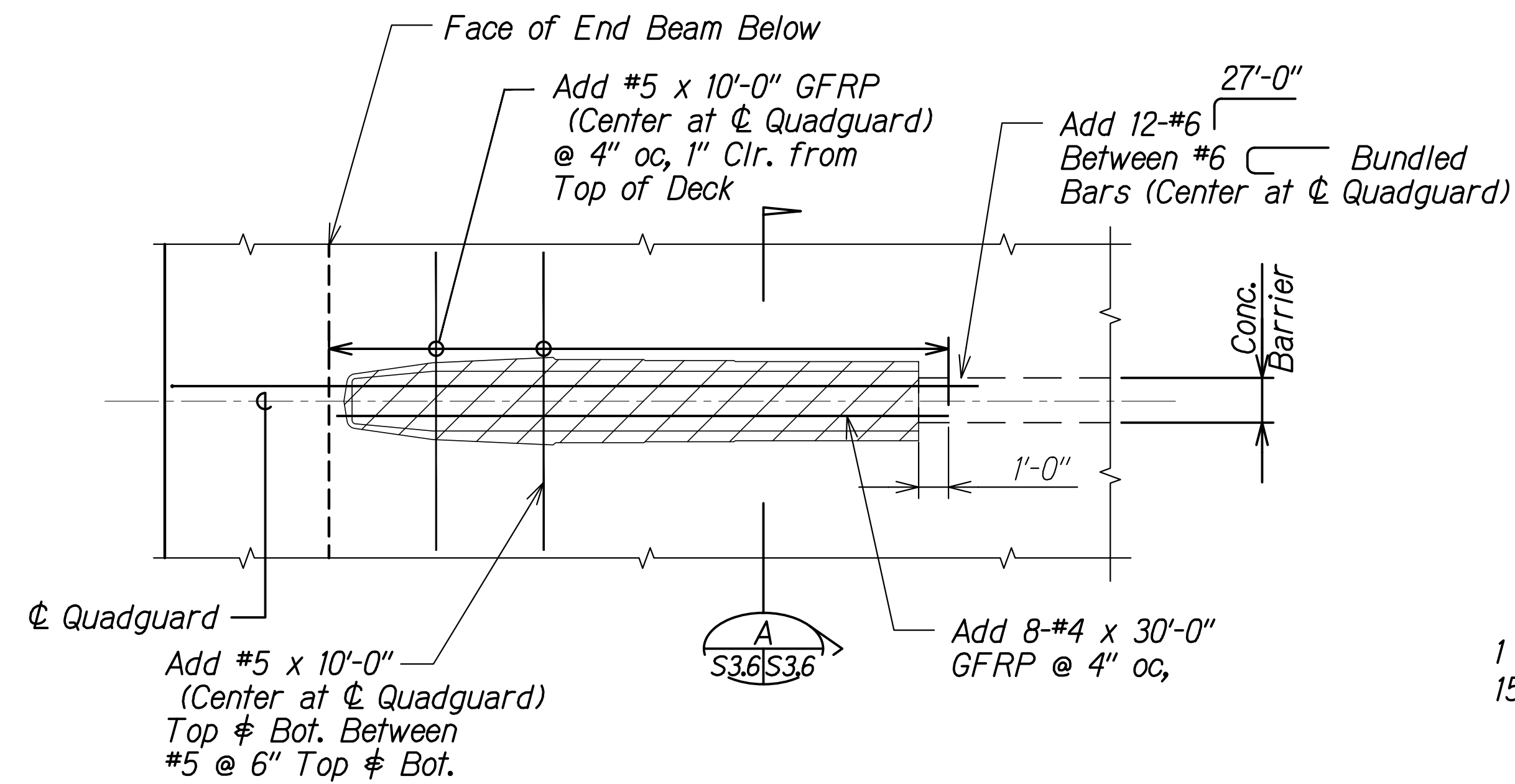
PARTIAL DECK SECTION

**KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)**

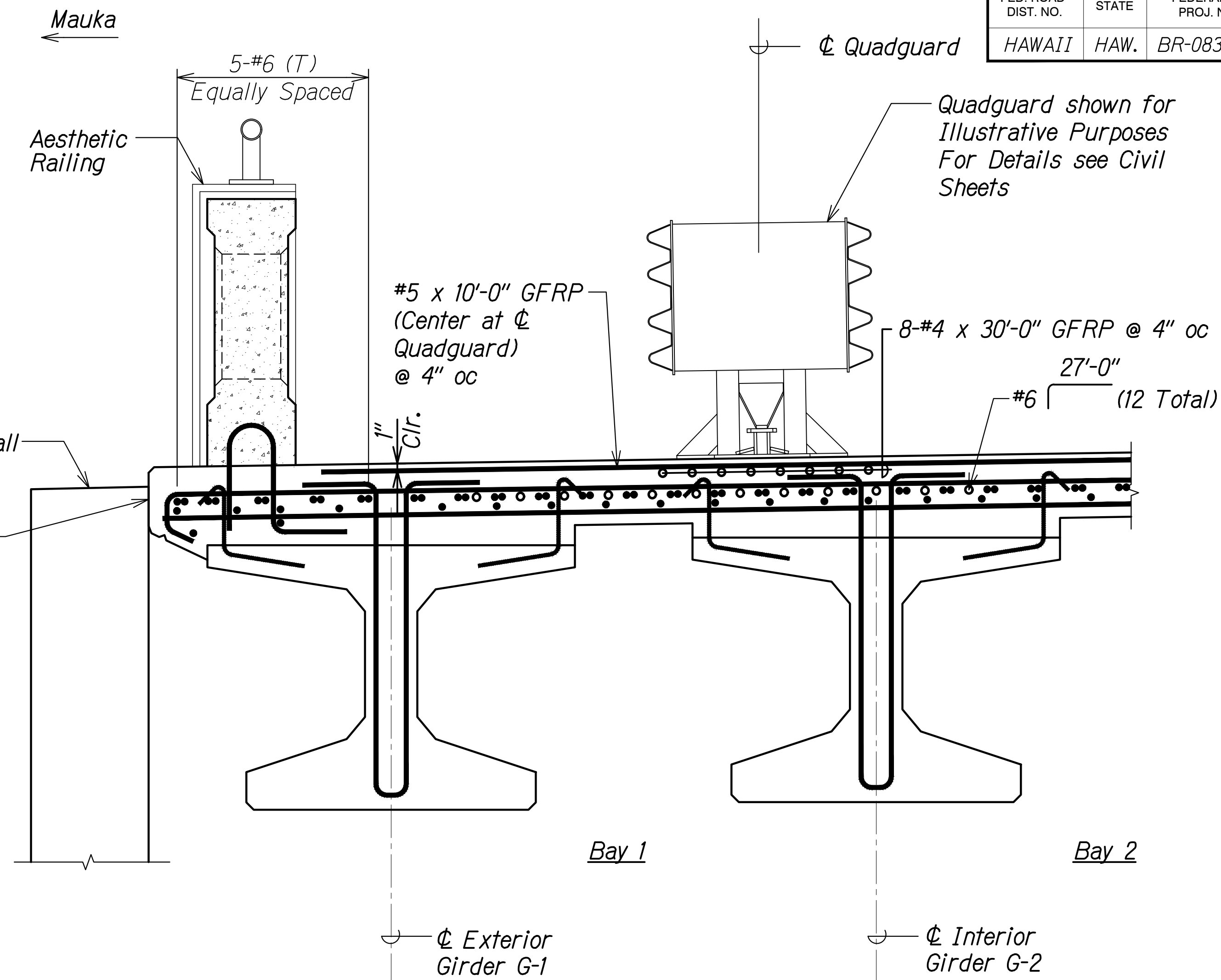
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SHEET No. S35 OF 7 SHEETS

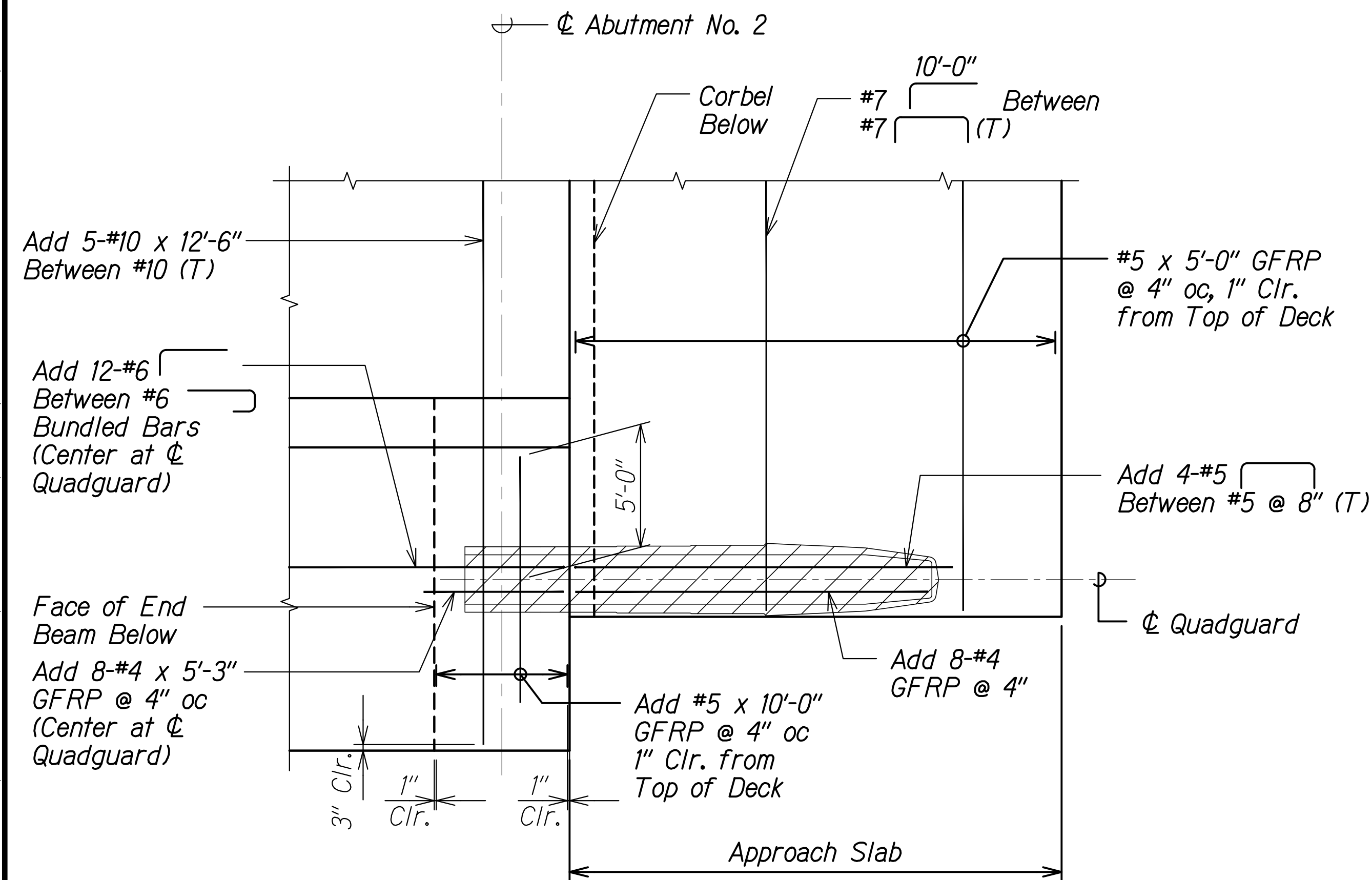
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|---------------------|-------|-----------------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 87 | 161 |



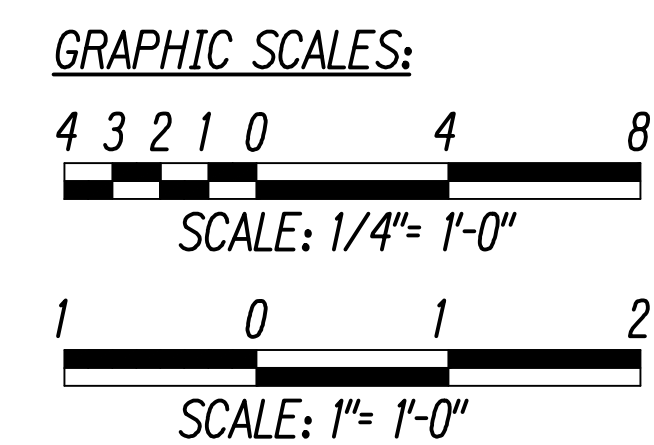
PARTIAL REINF. PLAN AT KANEOHE-MAUKA QUADGUARD 1
 Scale: 1/4" = 1'-0" S3.6 S3.6



SECTION A
 Scale: 1" = 1'-0" S3.1 S3.6
 S3.6



PARTIAL REINF. PLAN AT KAHUKU-MAKAI QUADGUARD 2
 Scale: 1/4" = 1'-0" S3.6 S3.6



DENNIS K. MITSUNAGA
 LICENSED PROFESSIONAL ENGINEER
 No. 2422-S
 HAWAII, U.S.A.
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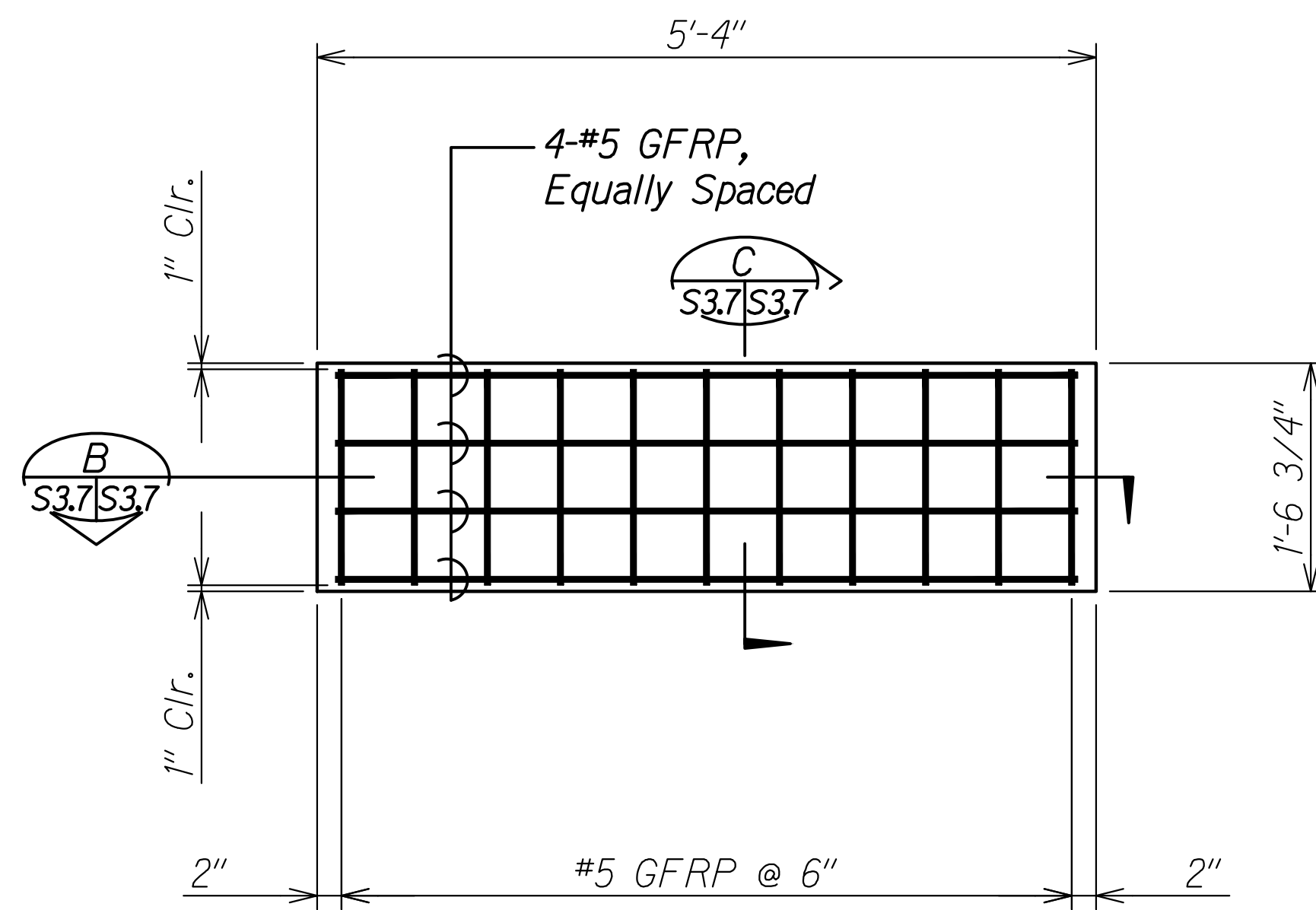
 DATE: 4/30/22
 MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
DECK REINFORCING AT QUADGUARD
 KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)
 Scale: As Noted Date: February 2021
 SHEET No. S36 OF 7 SHEETS

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| ORIGINAL PLAN | DATE |
| REVISED BY | DATE |
| DESIGNED BY | DATE |
| CHECKED BY | DATE |
| NO. | |

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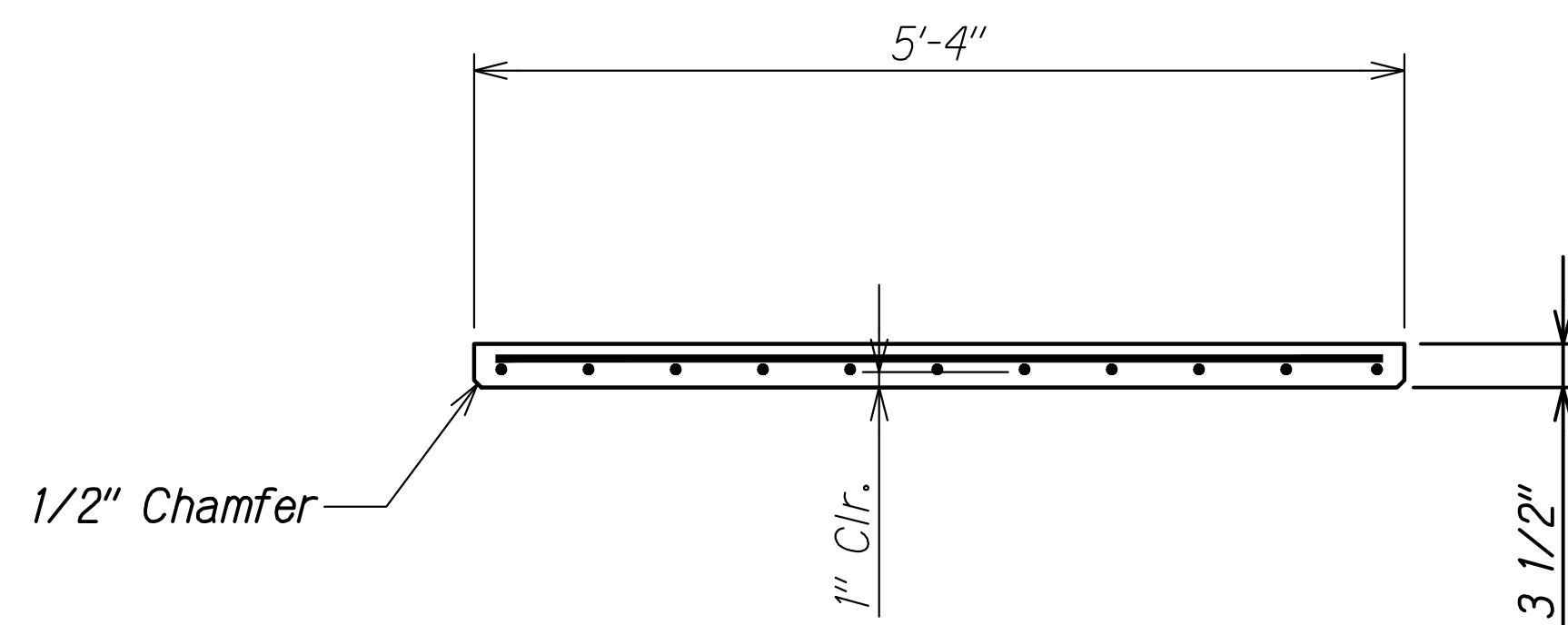
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| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 88 | 161 |



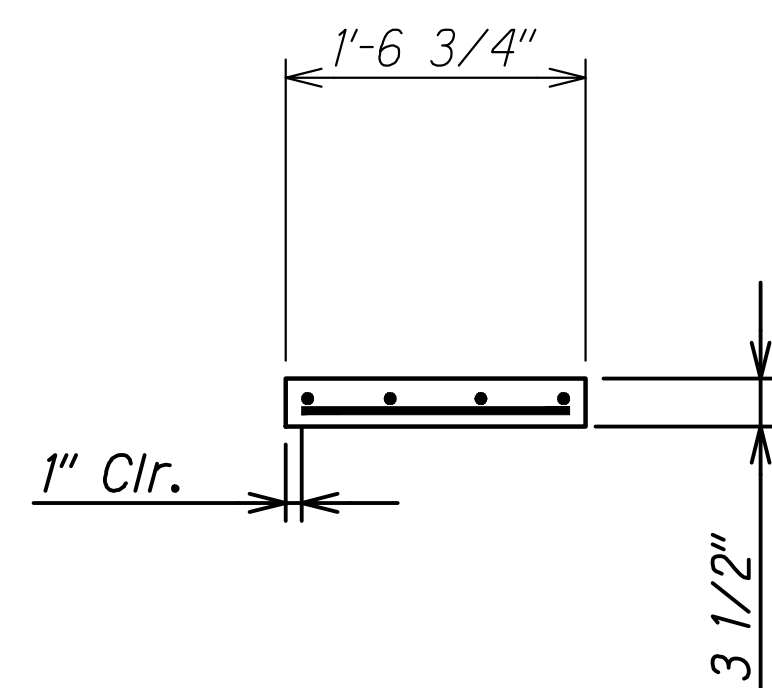
PLAN
Scale: 1" = 1'-0"
S3.7 S3.7

Notes:

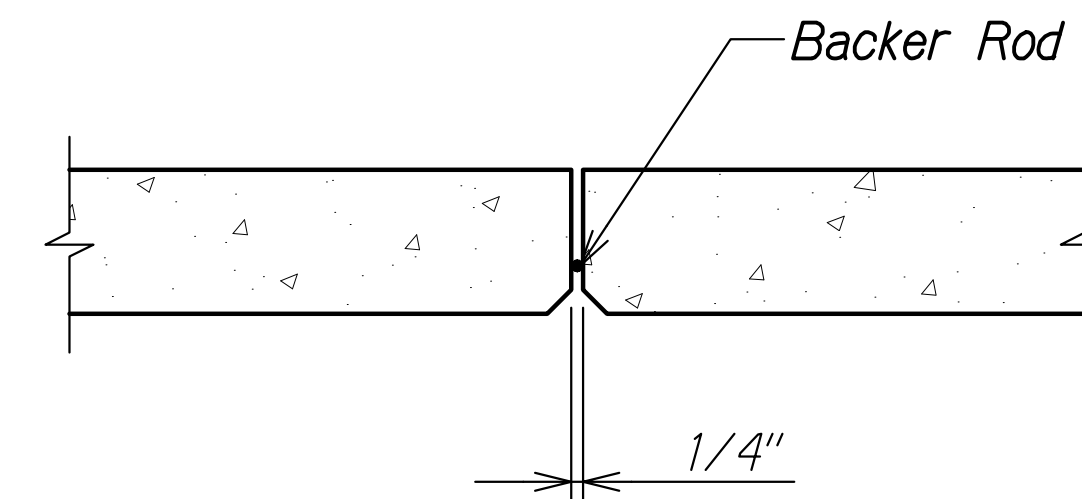
1. Details and locations of lifting devices shall be submitted to the Engineer for approval. Such approval does not relieve the Contractor of his responsibilities if the precast deck form is damaged due to failure of lifting device.
2. Contractor shall submit alternative method to lift precast deck form if lifting devices are damaged for review and acceptance.
3. Roughen top surface of precast deck form to 1/4" minimum amplitude.
4. Precast deck form is incidental to deck concrete.
5. GFRP is incidental to the precast deck form.



SECTION B
Scale: 1" = 1'-0"
S3.7 S3.7

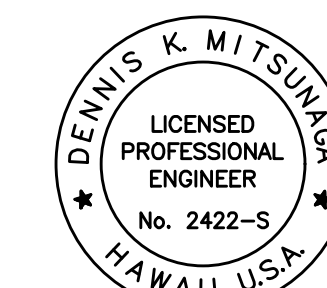
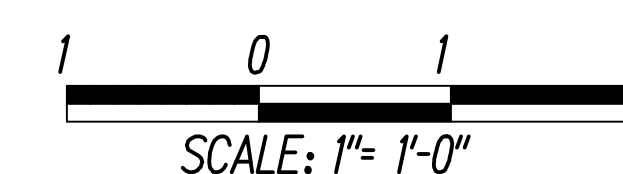


SECTION C
Scale: 1" = 1'-0"
S3.7 S3.7



TRANSVERSE JOINT 1
Scale: 3" = 1'-0"
S3.7 S3.7

GRAPHIC SCALE:



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PRECAST DECK FORM

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

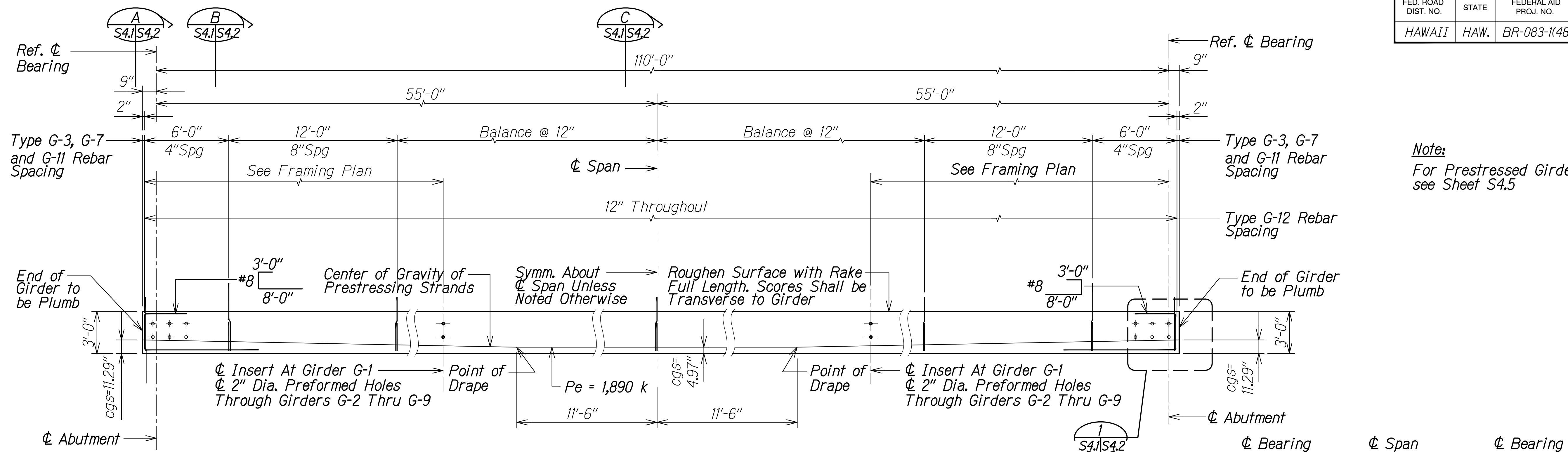
SHEET No. S37 OF 7 SHEETS

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| ORIGINAL PLAN | DATE |
| DESIGNED BY | |
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| CHECKED BY | |
| NO. | |

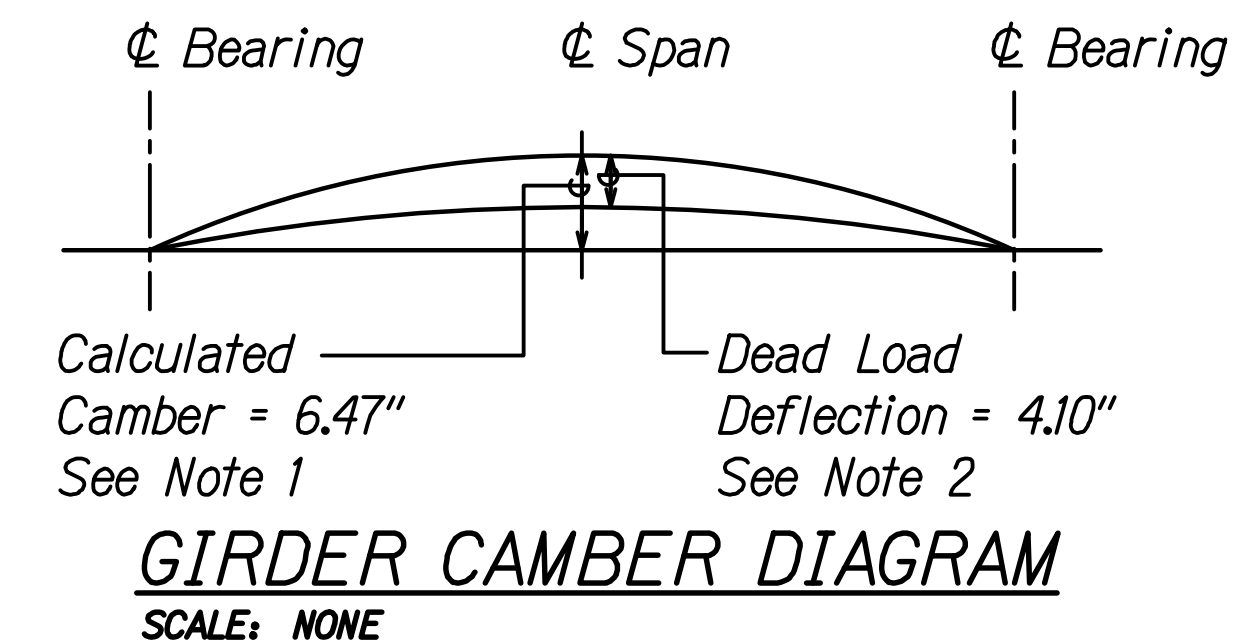
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| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 89 | 161 |

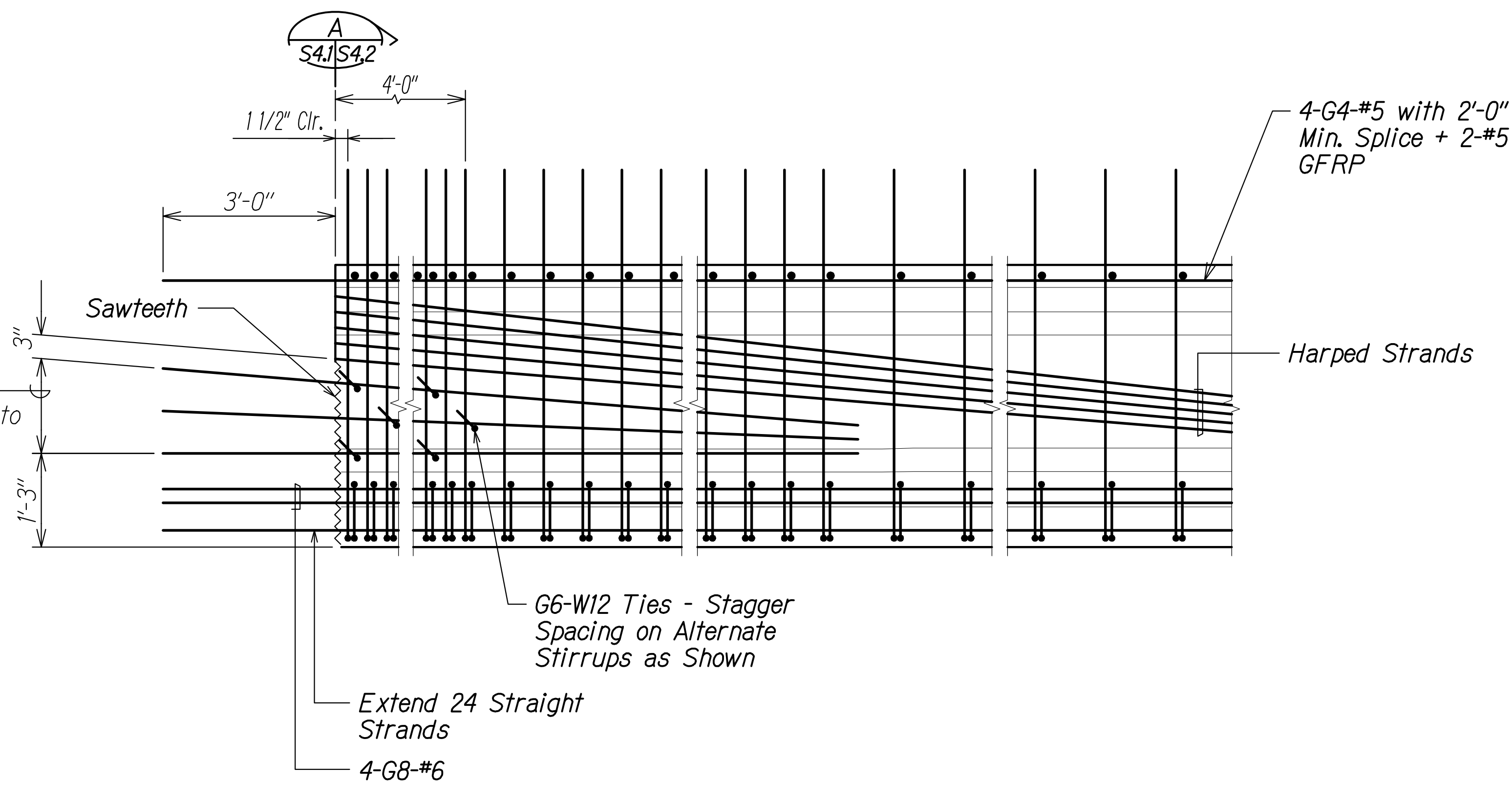
Note:
For Prestressed Girder notes, see Sheet S4.5



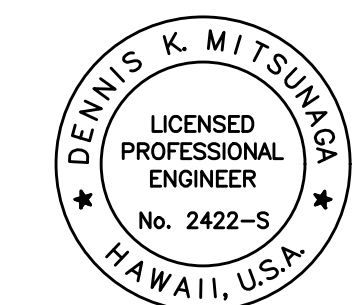
TYPE I PRESTRESSED GIRDER ELEVATION (G-1 THROUGH G-9)
Scale: N.T.S.



- GIRDER CAMBER NOTES:**
- The calculated camber includes the effect of the initial prestress force and the weight of the girder after removal from the bed. The calculated camber value has been multiplied by creep factor to approximate the effect of camber growth and concrete creep. Positive values shown for initial camber indicate a net upward deflection. Maximum camber immediately prior to erection of girders shall not exceed the calculated camber by more than 1 inch. Girders with cambers exceeding the maximum camber will not be accepted.
 - The dead load deflection includes the combined effects of the weight of slab, drop panels, and diaphragms.
 - Contractor shall camber the deck form work as required to account for the calculated dead load deflection in order to provide the specified finish deck elevations.
 - All cambers and deflections are in inches.
 - Working force is designated as P_e .



TYPICAL END ELEVATION
Not to Scale



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HIGHWAYS DIVISION

TYPE I PRESTRESSED GIRDER

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

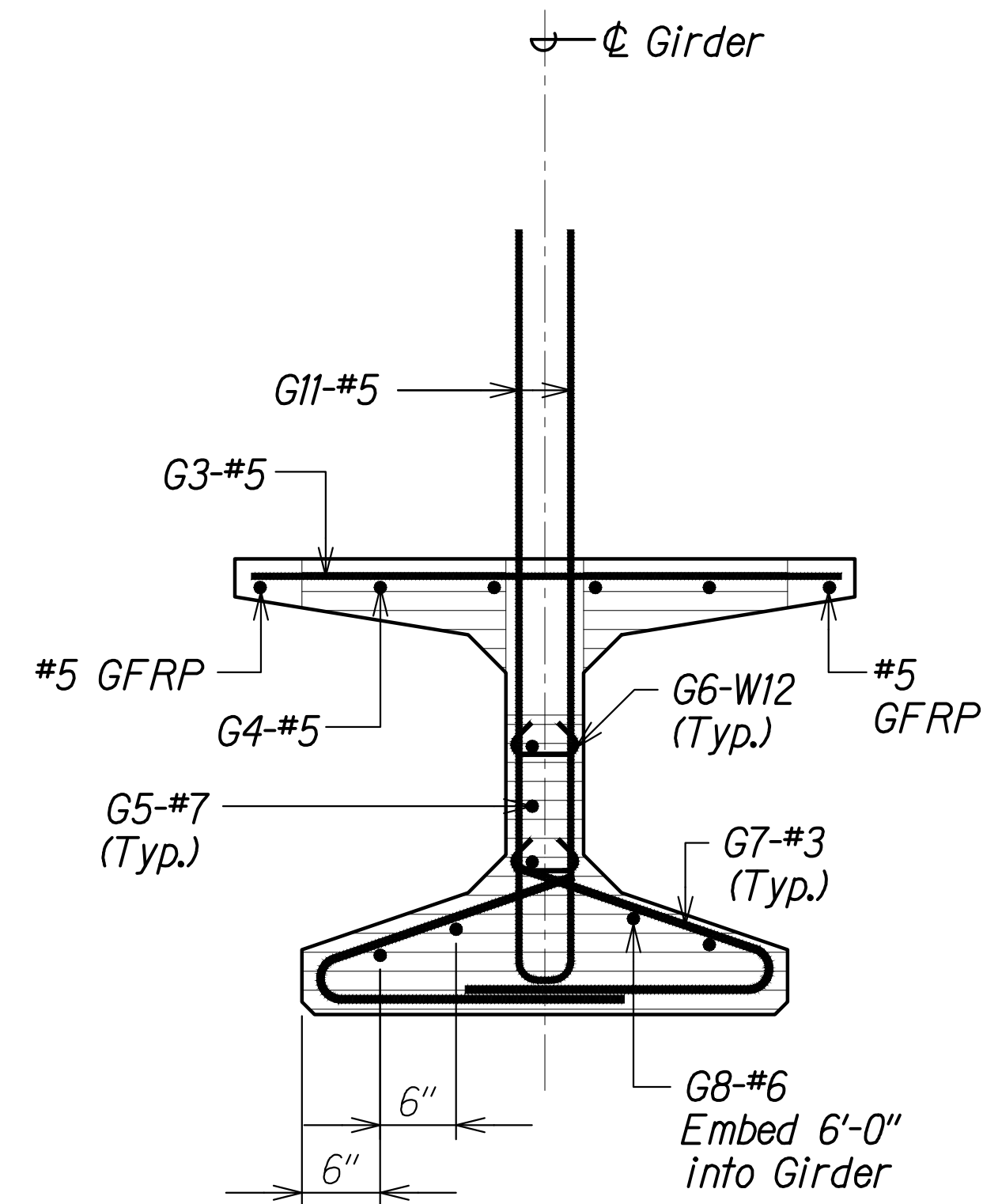
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SHEET No. S4J OF 5 SHEETS

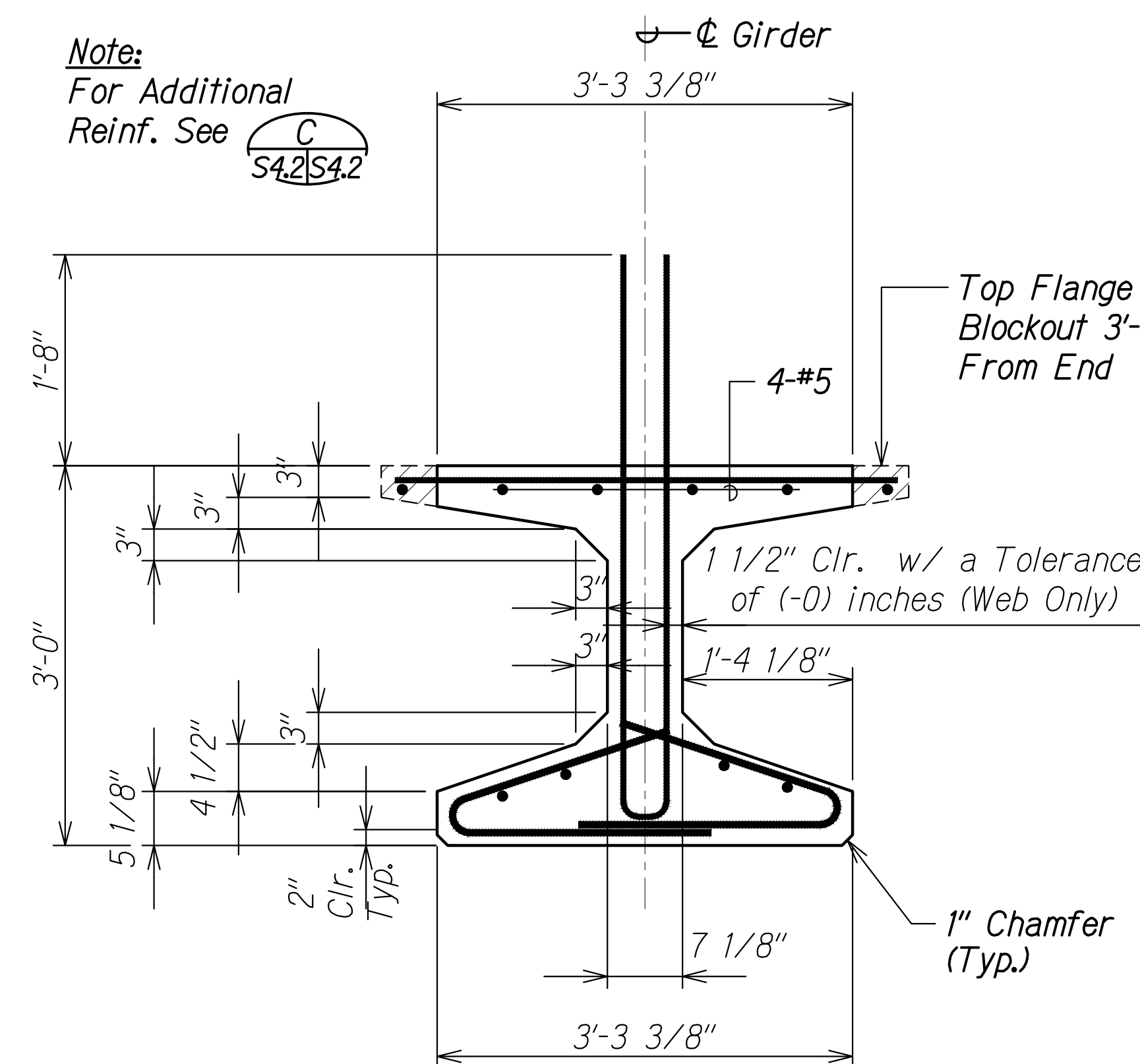
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| ORIGINAL PLAN | DATE |
| NO. BOOK | DESIGNED BY |
| QUANTITIES BY | CHECKED BY |

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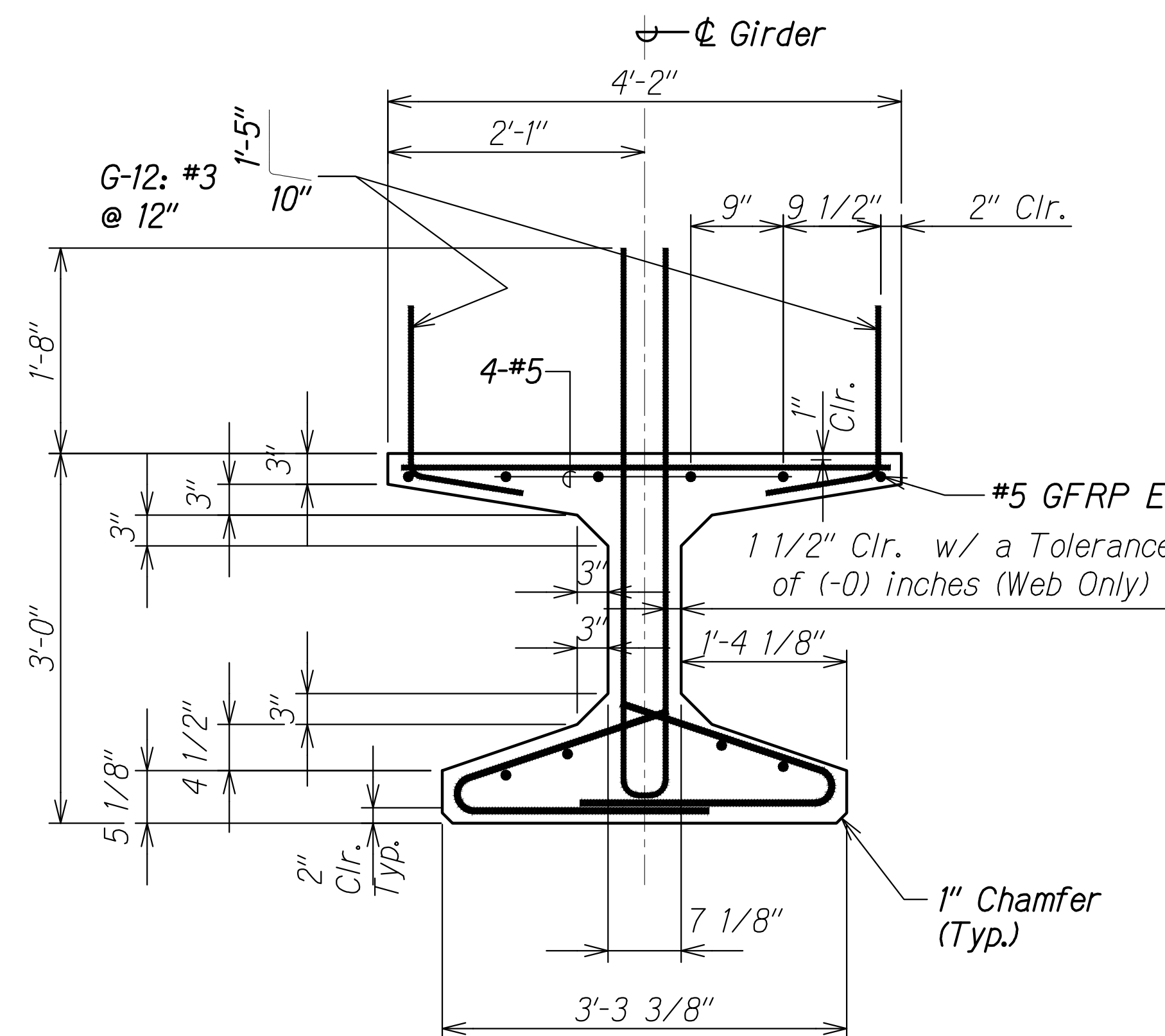
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|---------------------|-------|-----------------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 90 | 161 |



END ELEVATION A
Scale: 1" = 1'-0"
S4.1 | S4.2

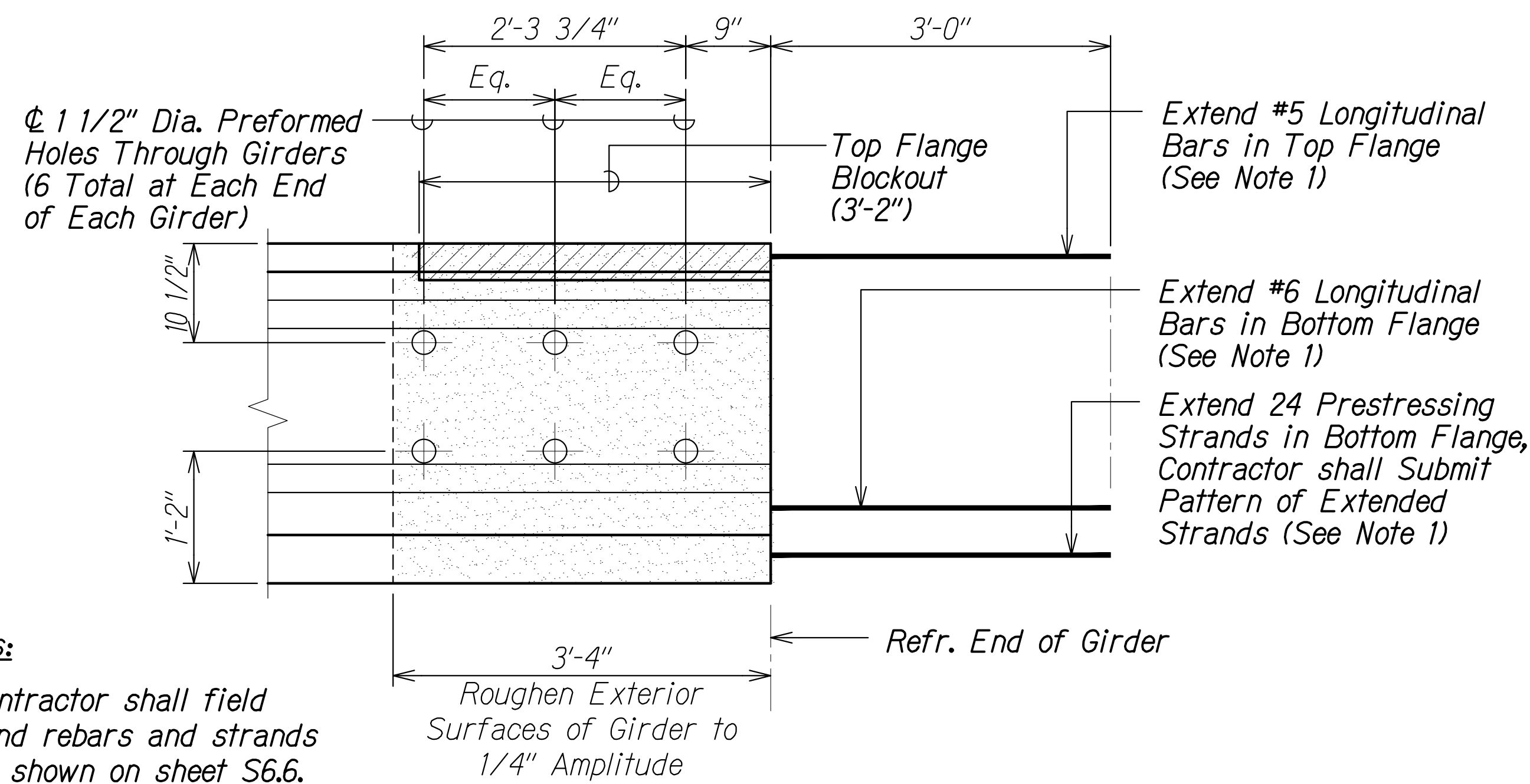


SECTION WITHIN END BEAM B
Scale: 1" = 1'-0"
S4.1 | S4.2



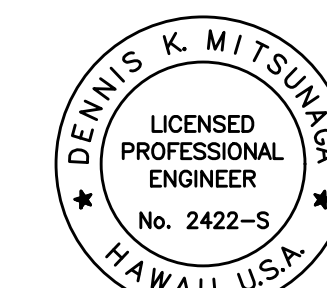
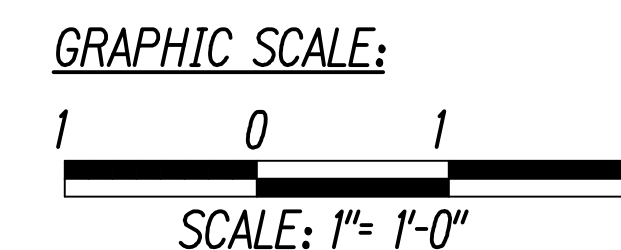
TYPICAL SECTION C
Scale: 1" = 1'-0"
S4.1 | S4.2

- Notes:**
- Sawteeth Shown by Hatched Area
 - Strands Not Shown
 - Type I Girders (G-1 Through G-9)
 - For G Type Reinforcing see Sht. S4.5



TYPE I GIRDER END DETAIL 1
Scale: 1" = 1'-0"
S4.2 | S4.2

- Notes:**
- Contractor shall field bend rebars and strands as shown on sheet S6.6.
 - See S4.1 for additional reinforcing details.



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE I GIRDER SECTIONS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

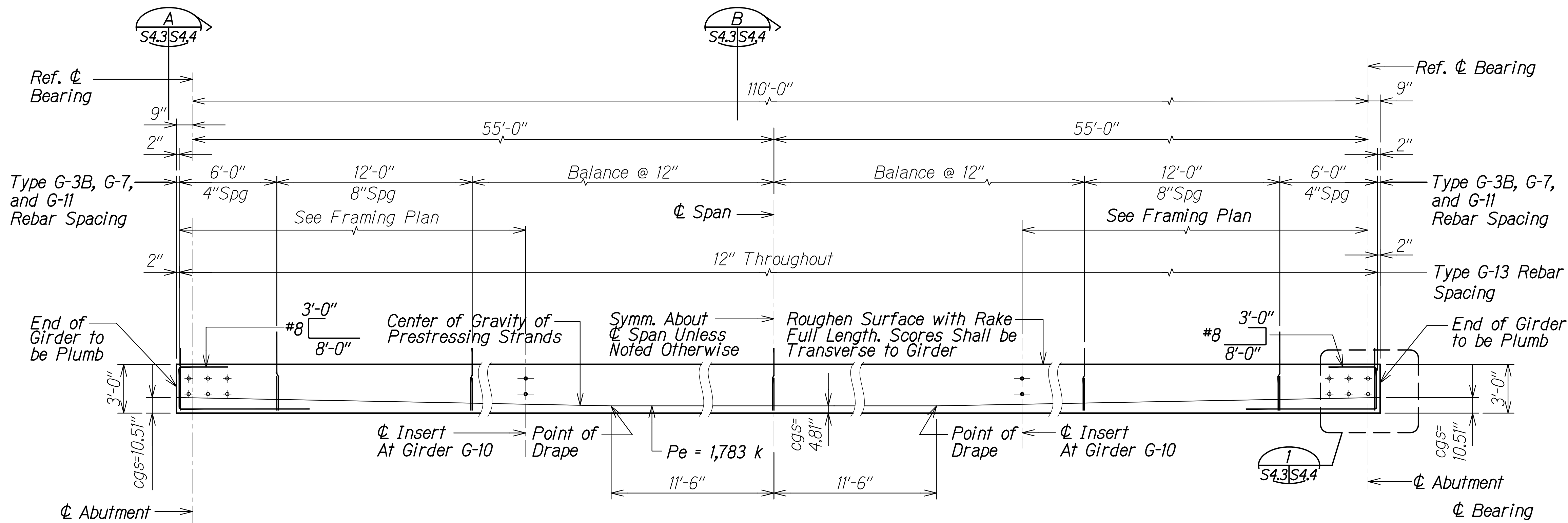
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SHEET No. S42 OF 5 SHEETS

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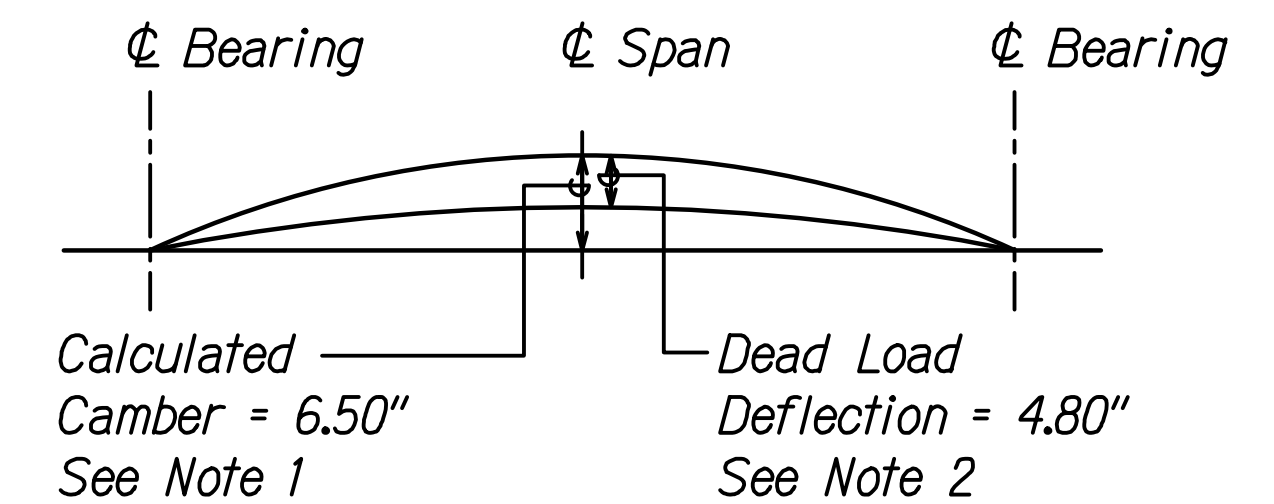
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| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 91 | 161 |



Note:
For Prestressed Girder notes, see Sheet S4.5.

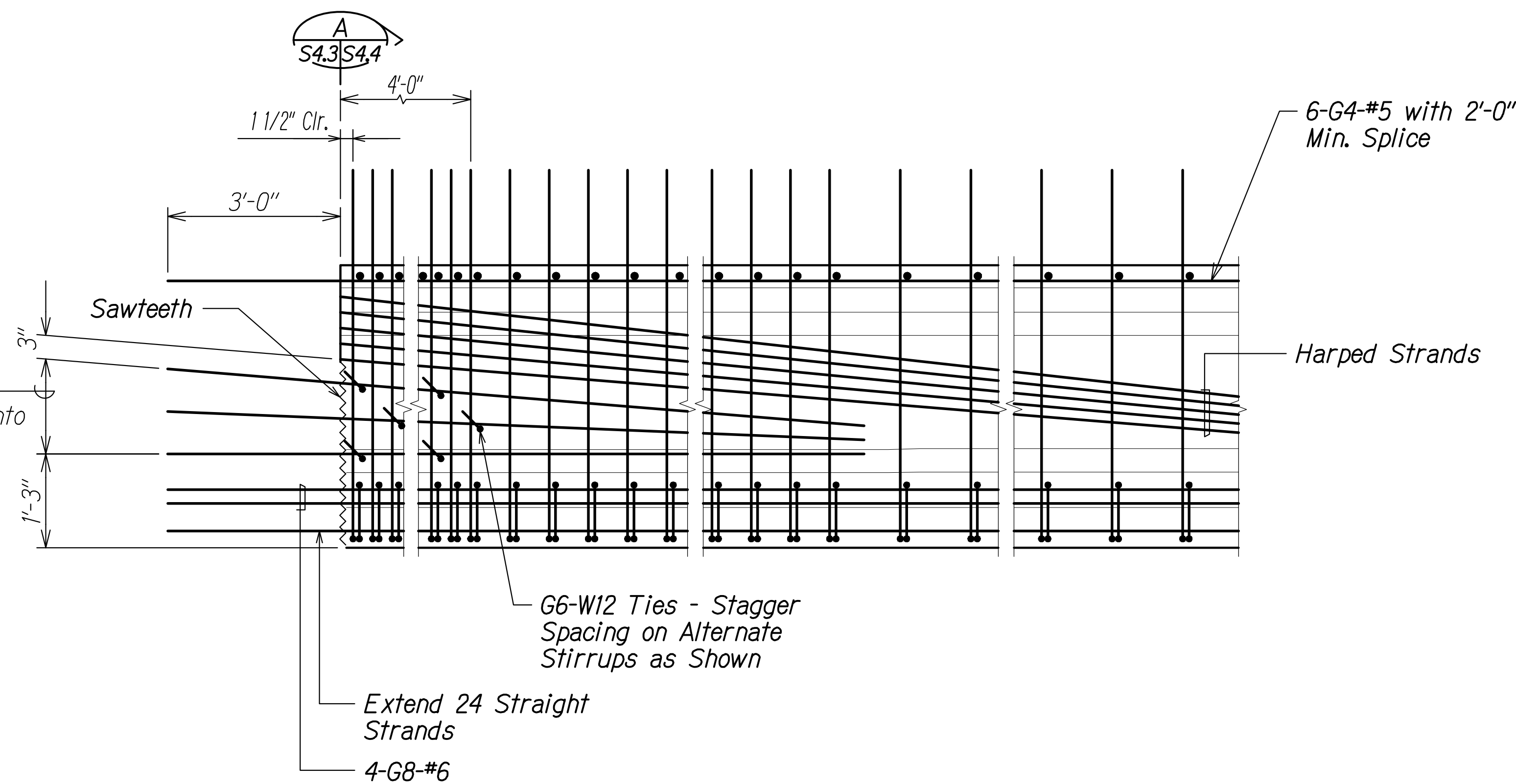
TYPE II PRESTRESSED GIRDER ELEVATION (G-10 AND G-11)
Scale: N.T.S.



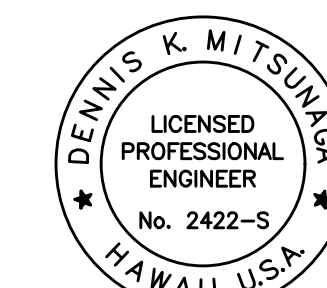
GIRDER CAMBER DIAGRAM
SCALE: NONE

GIRDER CAMBER NOTES:

1. The calculated camber includes the effect of the initial prestress force and the weight of the girder after removal from the bed. The calculated camber value has been multiplied by creep factor to approximate the effect of camber growth and concrete creep. Positive values shown for initial camber indicate a net upward deflection. Maximum camber immediately prior to erection of girders shall not exceed the calculated camber by more than 1 inch. Girders with cambers exceeding the maximum camber will not be accepted.
2. The dead load deflection includes the combined effects of the weight of slab, drop panels, and diaphragms.
3. Contractor shall camber the deck form work as required to account for the calculated dead load deflection in order to provide the specified finish deck elevations.
4. All cambers and deflections are in inches.
5. Working force is designated as P_e .



TYPICAL END ELEVATION
Not to Scale



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STATE OF HAWAII
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HIGHWAYS DIVISION

TYPE II PRESTRESSED GIRDER

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

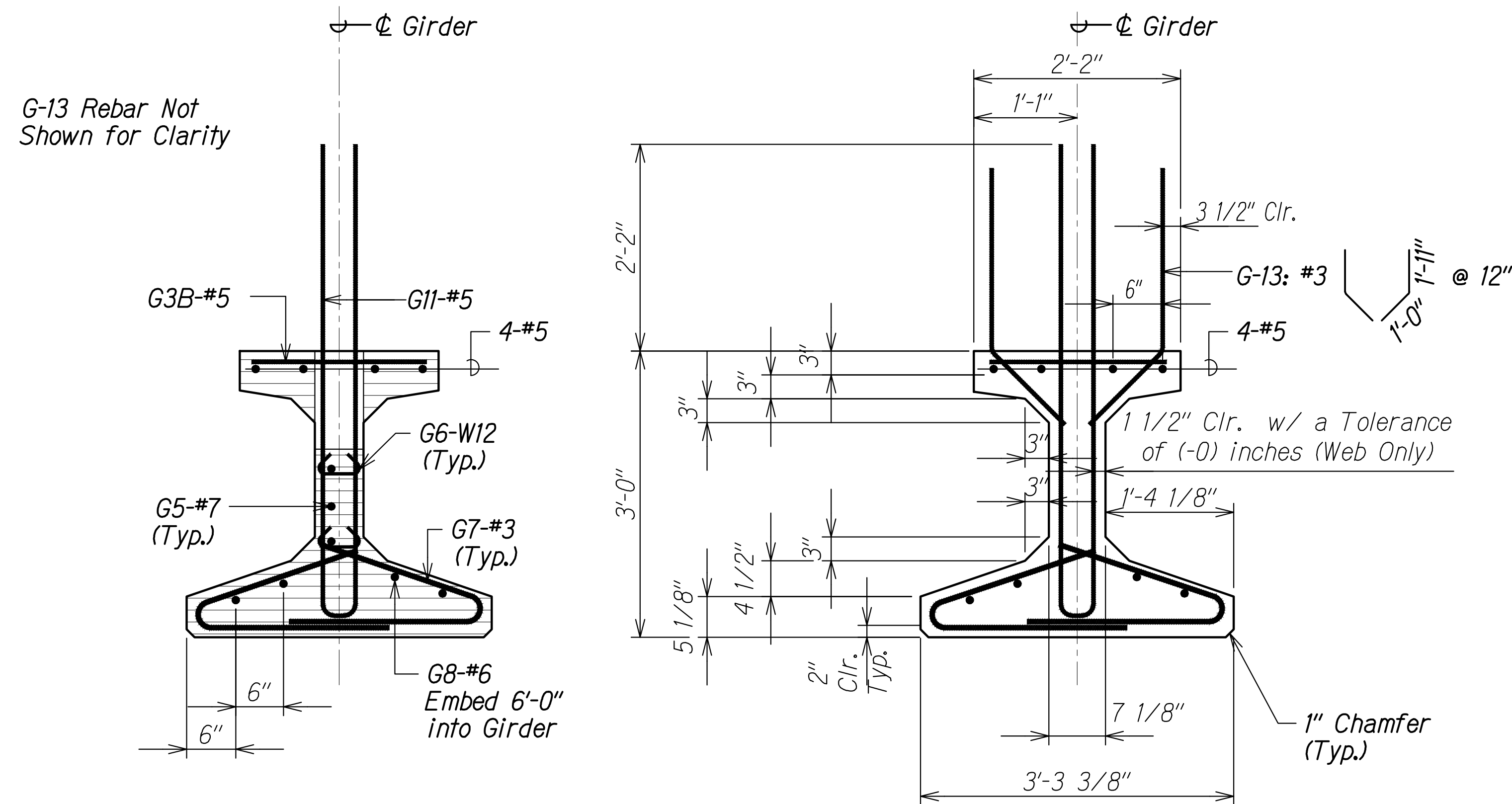
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SHEET No. S4.3 OF 5 SHEETS

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| QUANTITIES BY | |
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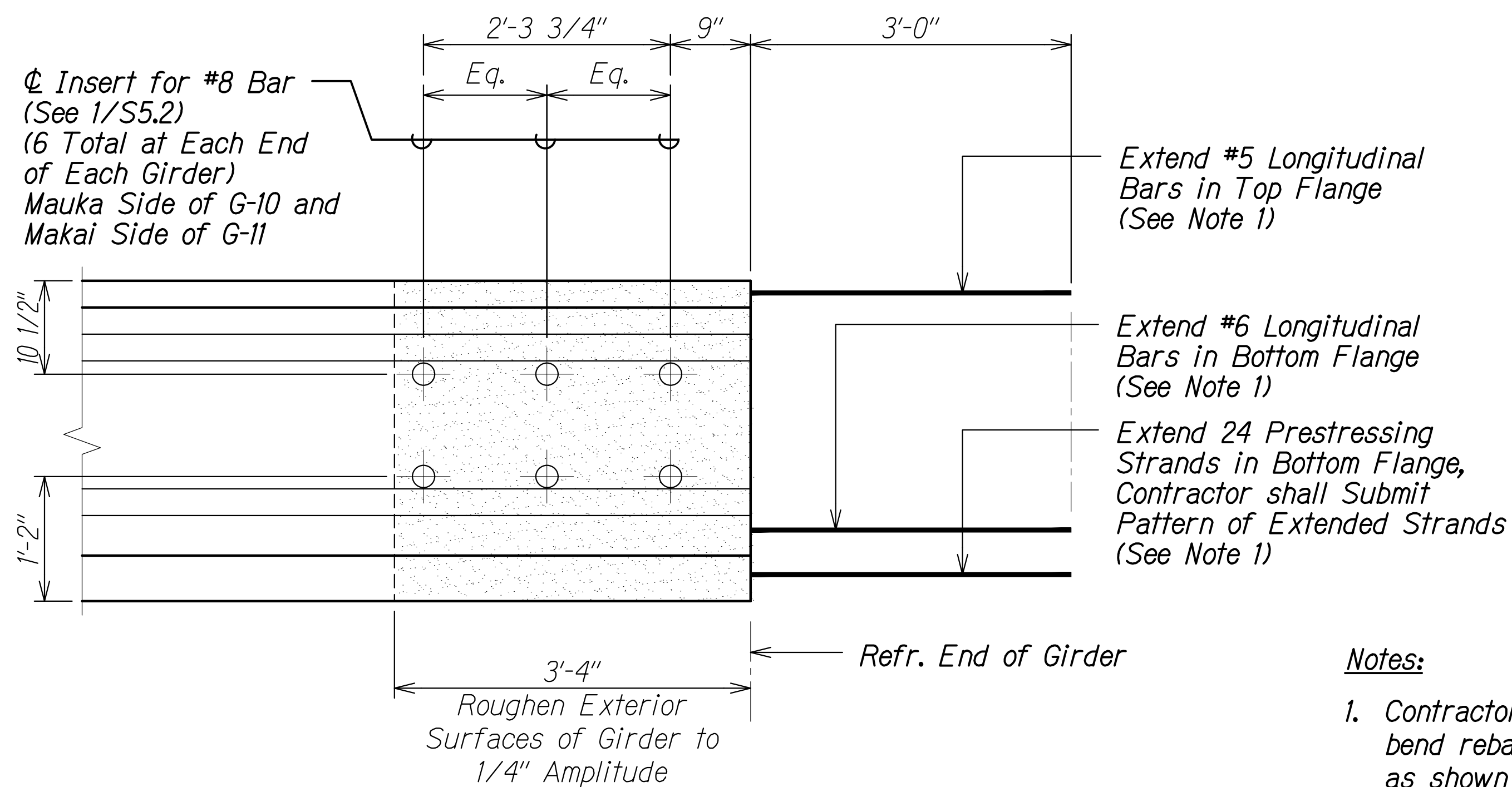
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| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 92 | 161 |



- Notes:**
- Sawteeth Shown by Hatched Area
 - Strands Not Shown
 - Type II Girders (G-10 and G-11)
 - For G Type Reinforcing see Sht. S4.5

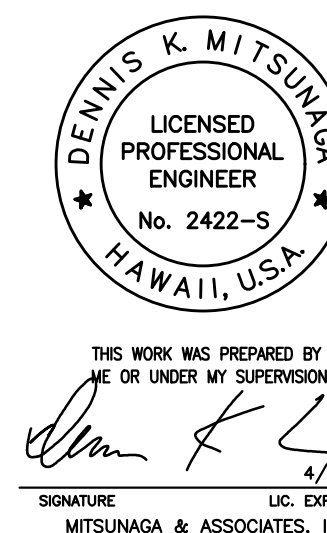
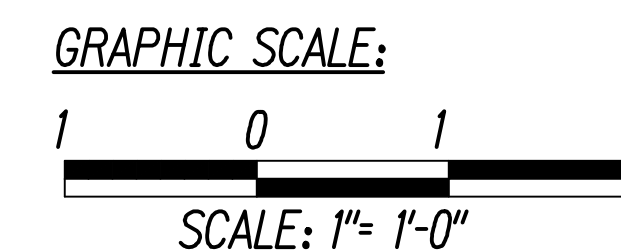
END ELEVATION A
Scale: 1" = 1'-0" S4.3 | S4.4

TYPICAL SECTION B
Scale: 1" = 1'-0" S4.3 | S4.4



- Notes:**
- Contractor shall field bend rebars and strands as shown on sheet S6.6.
 - See S4.3 for additional reinforcing details.

TYPE II GIRDER END DETAIL 1
Scale: 1" = 1'-0" S4.3 | S4.4



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE II GIRDER SECTIONS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S44 OF 5 SHEETS

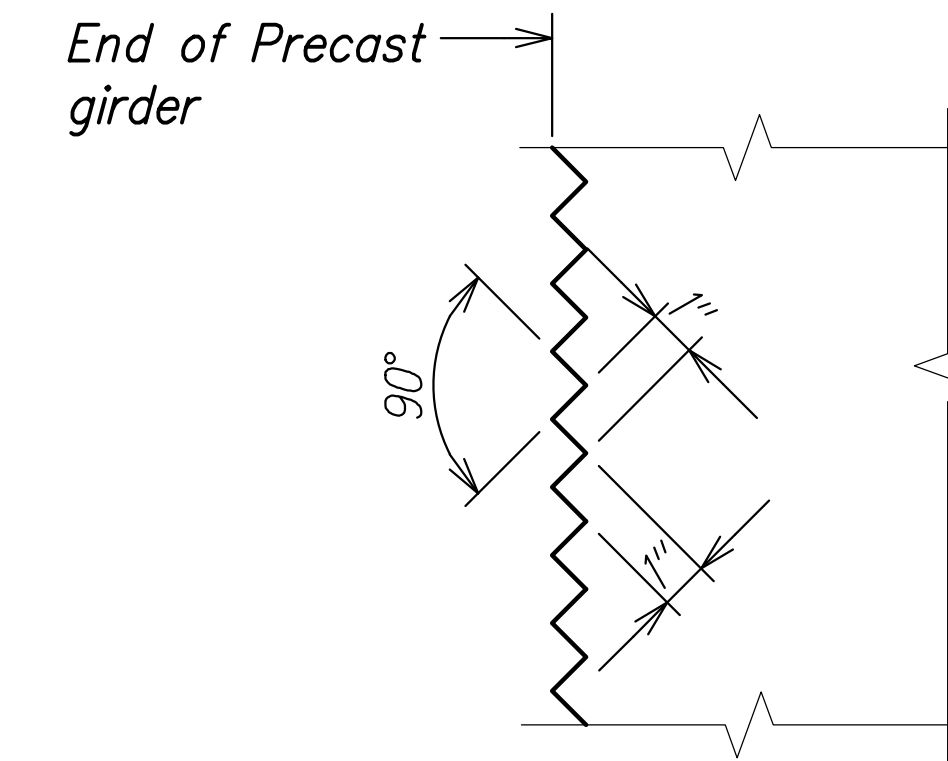
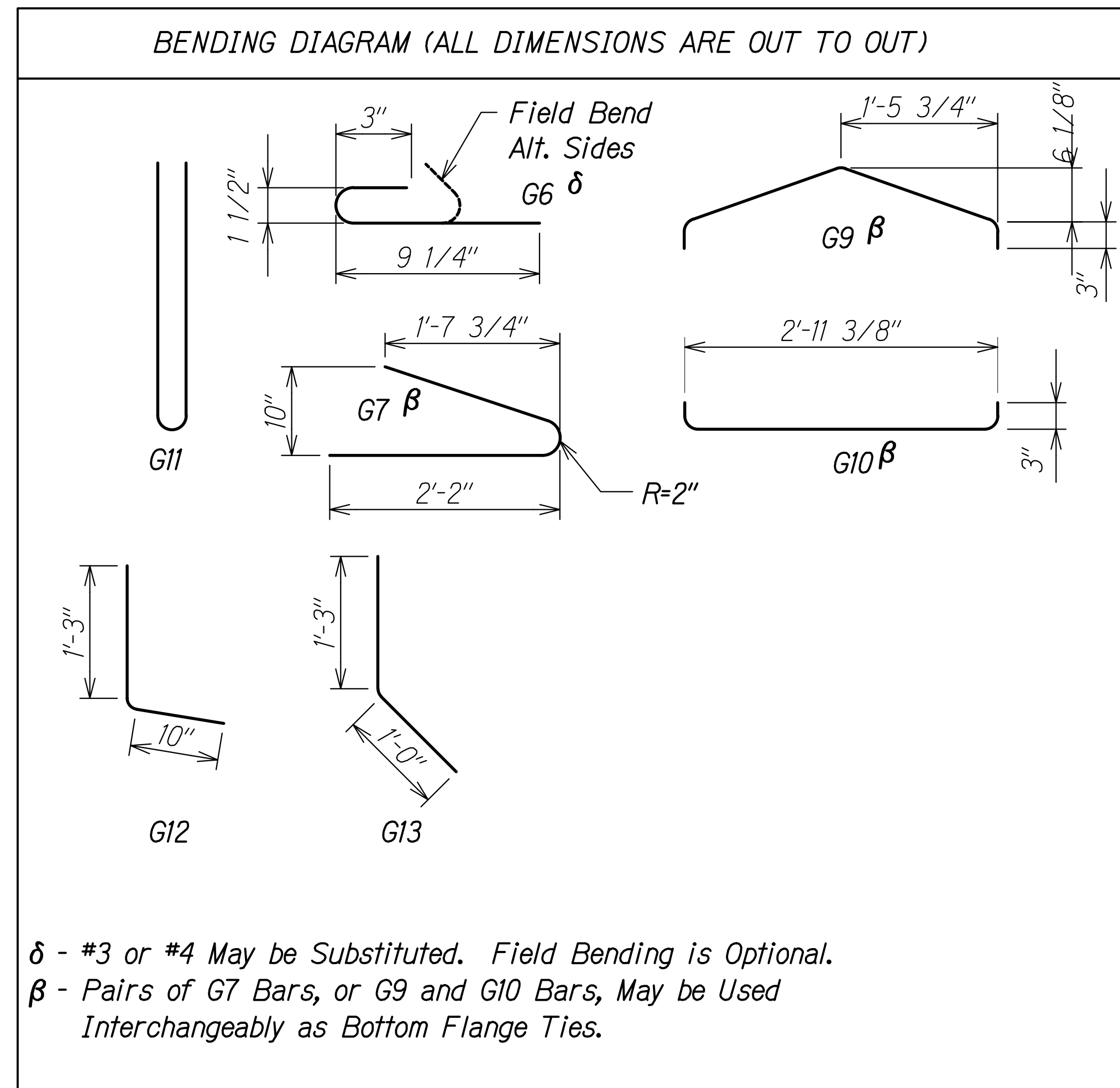
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| QUANTITIES BY _____ | |
| DATE _____ | |

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| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-----------------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 93 | 161 |

PRESTRESSED GIRDER NOTES:

- Prestressed steel shall be 7-wire 0.6-inch diameter ASTM A416 Grade 270 low-relaxation strand.
- See framing plans for location of diaphragms, ϕ bearing to ϕ bearing, and girder spacing.
- Strand pattern shall be symmetrical about the longitudinal ϕ of the girder.
- Strand release sequence shall not induce any lateral deflection of the girder.
- Contractor shall submit shop drawings indicating proposed strand pattern, holes, inserts, releasing sequence, reinforcing details and hold down device details to the Engineer prior to fabrication.
- The Contractor shall incorporate all holes, inserts, and other embedded items required in girders during fabrication of the girders.
- Lifting devices shall be placed as close as possible to the center line bearing of the girder. Details and locations of lifting devices shall be submitted to the Engineer for approval. Such approval does not relieve the Contractor of his responsibilities if the girder is damaged due to failure of lifting device.
- Prior to casting girder Contractor shall field verify span lengths at each abutment.
- Contractor shall inspect all lifting devices for damage prior to delivery and immediately before installation.
- Contractor shall submit alternative method to lift girder if lifting devices are damaged for review and acceptance.
- Roughen top surface of girder to 1/4" min. amplitude.
- The compressive strength of the girder at strand release shall be at least 8,500 psi.
- See sheets S4.1 through S4.4 for rebar ϕ strand extensions.
- Contractor may adjust locations of holes ϕ inserts with the approval of the Engineer.
- The concrete shall pass a charge of less than 1000 Coulombs at 90-days from casting as determined by AASHTO T277. Concrete test specimens shall be cured under the same conditions as the Precast Girders.

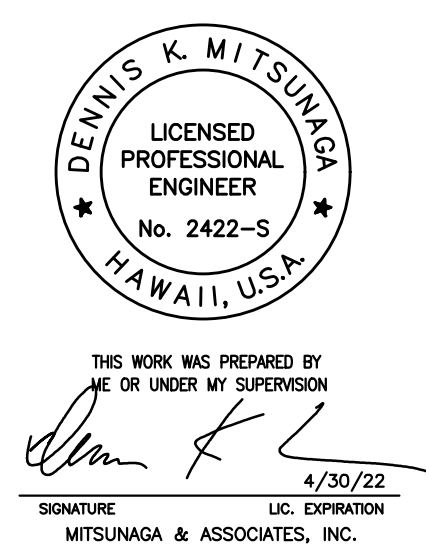


Sawteeth are full width

SAWTEETH DETAIL 1
 Not to Scale S4.5 S4.5

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| ORIGINAL PLAN | DATE |
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STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

**PRESTRESSED GIRDER NOTES
 AND DETAIL**

**KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)**

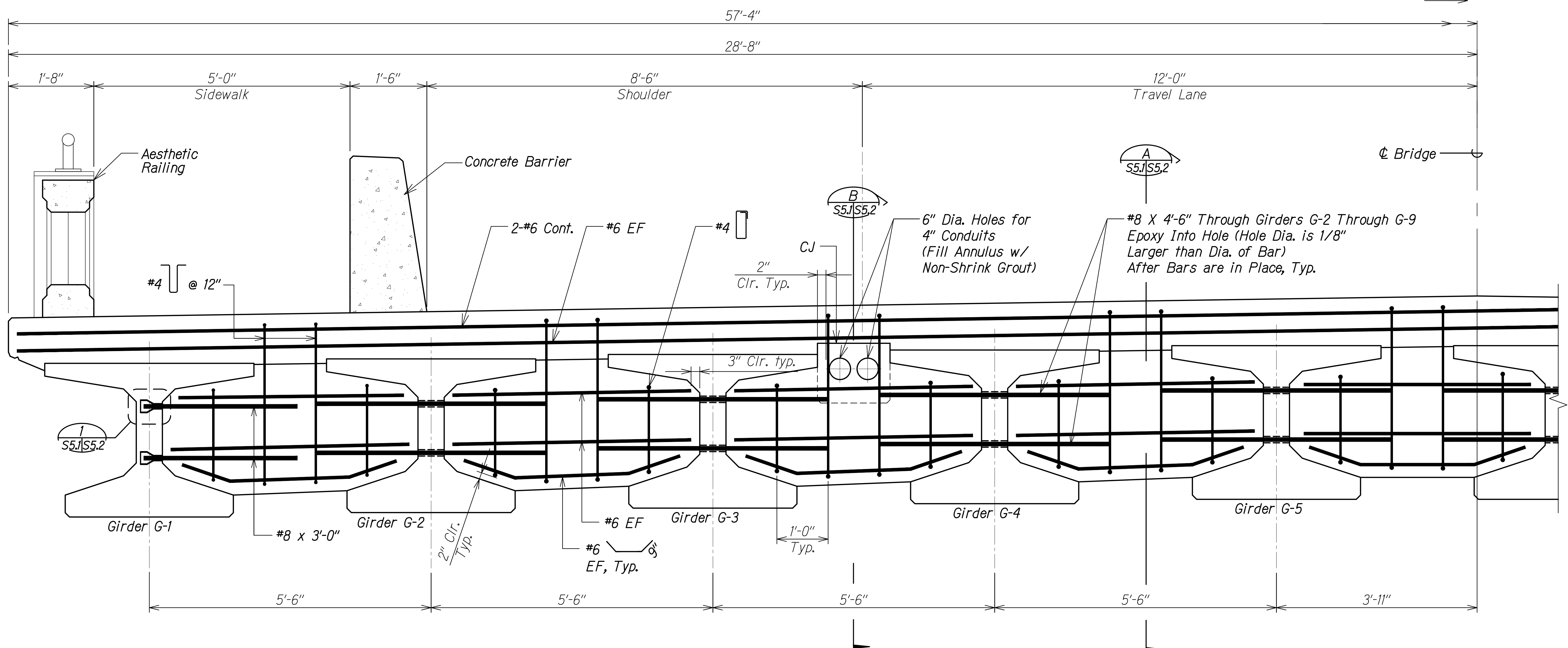
Scale: As Noted Date: February 2021

SHEET No. S45 OF 5 SHEETS

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| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 94 | 161 |

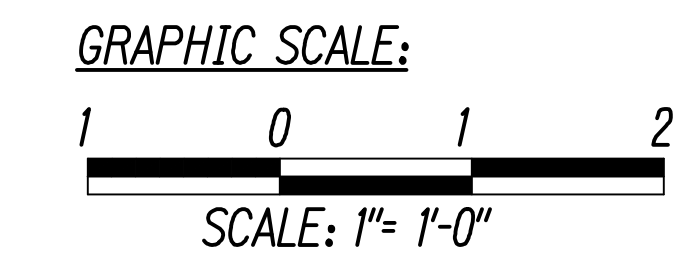
Mauka ←

→ Makai



Note:
Deck, Concrete Barrier, Aesthetic Railing and Precast Girder Reinforcing are not shown for clarity.

DIAPHRAGM "A" ELEVATION
Scale: 1" = 1'-0"



DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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4/30/22
SIGNATURE LIC. EXPIRATION
MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DIAPHRAGM ELEVATION

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

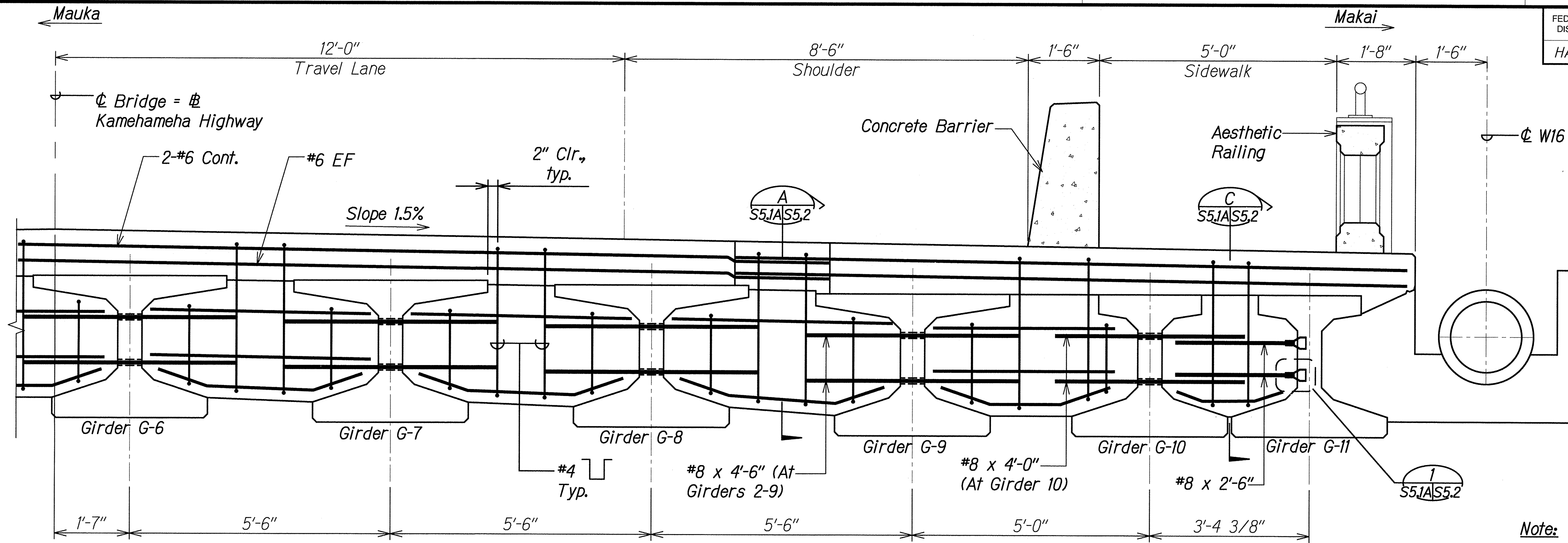
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SHEET No. S5.1 OF 3 SHEETS

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| NO. _____ | _____ |
| DESIGNED BY _____ | CHECKED BY _____ |
| QUANTITIES BY _____ | |
| DATE _____ | |

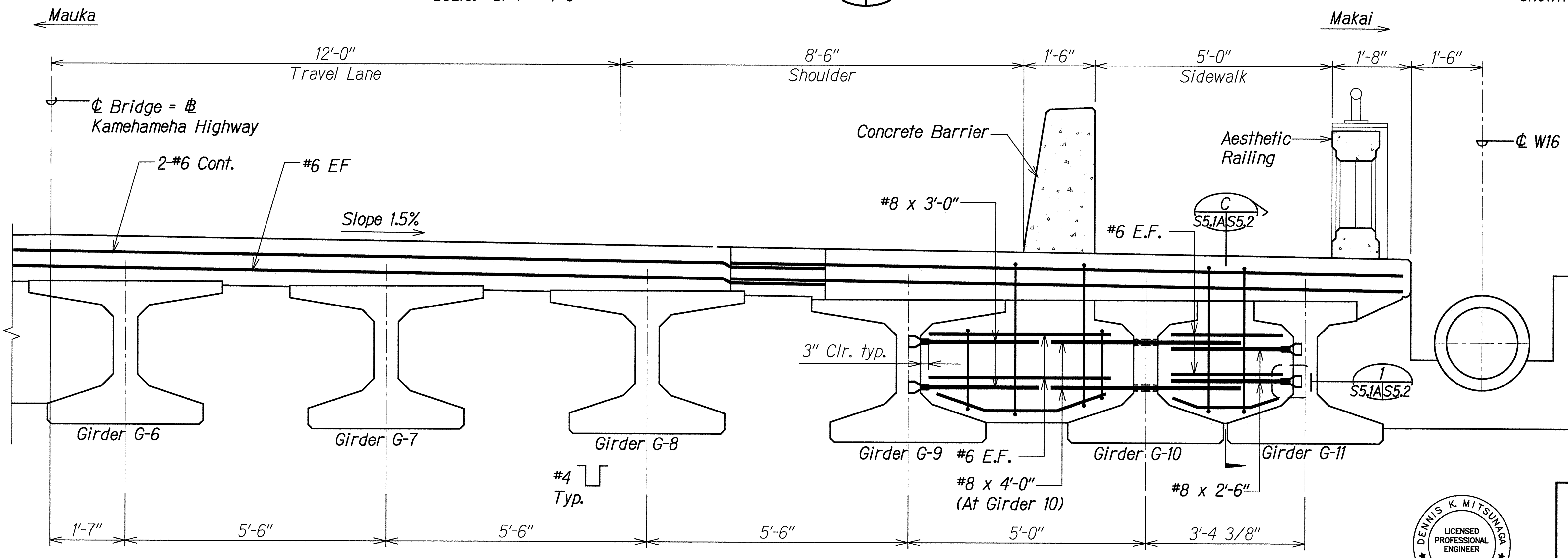
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| HAWAII | HAW. | BR-083-1(48) | 2021 | 95 | 161 |

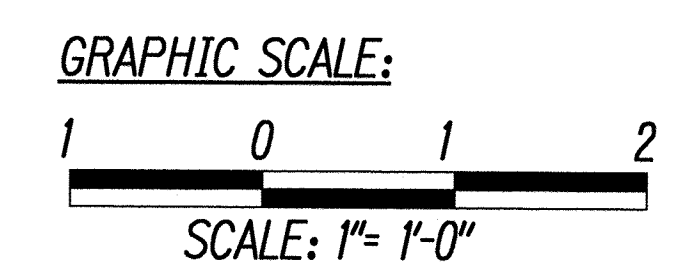


DIAPHRAGM "A" ELEVATION
 Scale: 3/4" = 1'-0"
 S5.1A S5.1A

Note:
 Deck, Concrete Barrier, Aesthetic Railing and Precast Girder Reinforcing are not shown for clarity.



DIAPHRAGM "B" ELEVATION
 Scale: 3/4" = 1'-0"
 S5.1A S5.1A



| | |
|--------------------|----------------|
| SURVEY PLOTTED BY: | DATE: |
| DRAWN BY: | DESIGNED BY: |
| NOTE BOOK: | QUANTITIES BY: |
| NO.: | CHECKED BY: |

APPROVED: *[Signature]* MAY 24 2021
 Manager and Chief Engineer, BWS
 (for work affecting BWS facilities
 State R/W & BWS easements only)

DENNIS K. MITSUNAGA
 LICENSED PROFESSIONAL ENGINEER
 No. 2422-S
 HAWAII, U.S.A.
 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
 DATE: 4/30/22
 SIGNATURE: *[Signature]* LIC. EXPIRATION: 4/30/22
 MITSUNAGA & ASSOCIATES, INC.

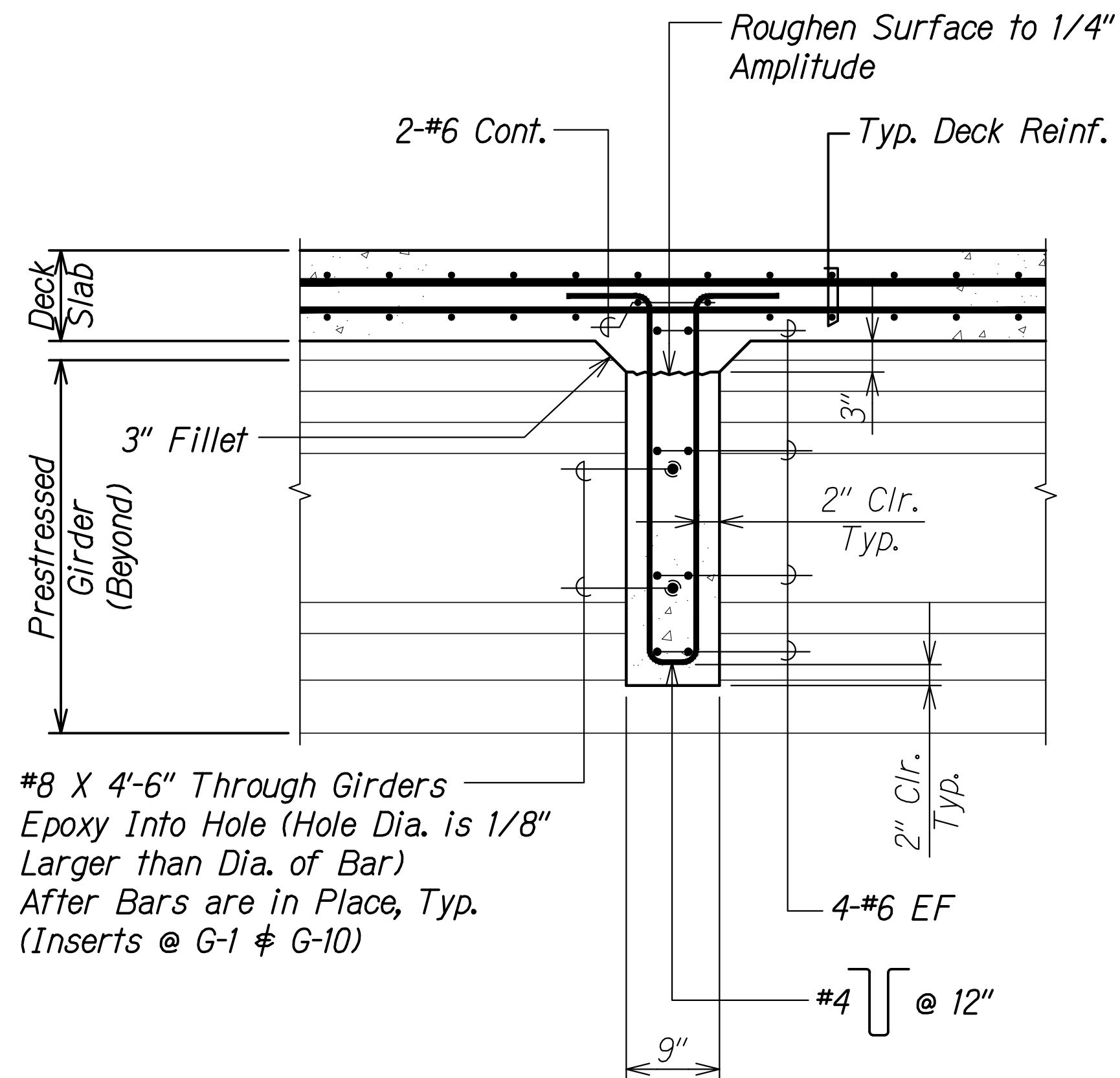
STATE OF HAWAII
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DIAPHRAGM ELEVATION

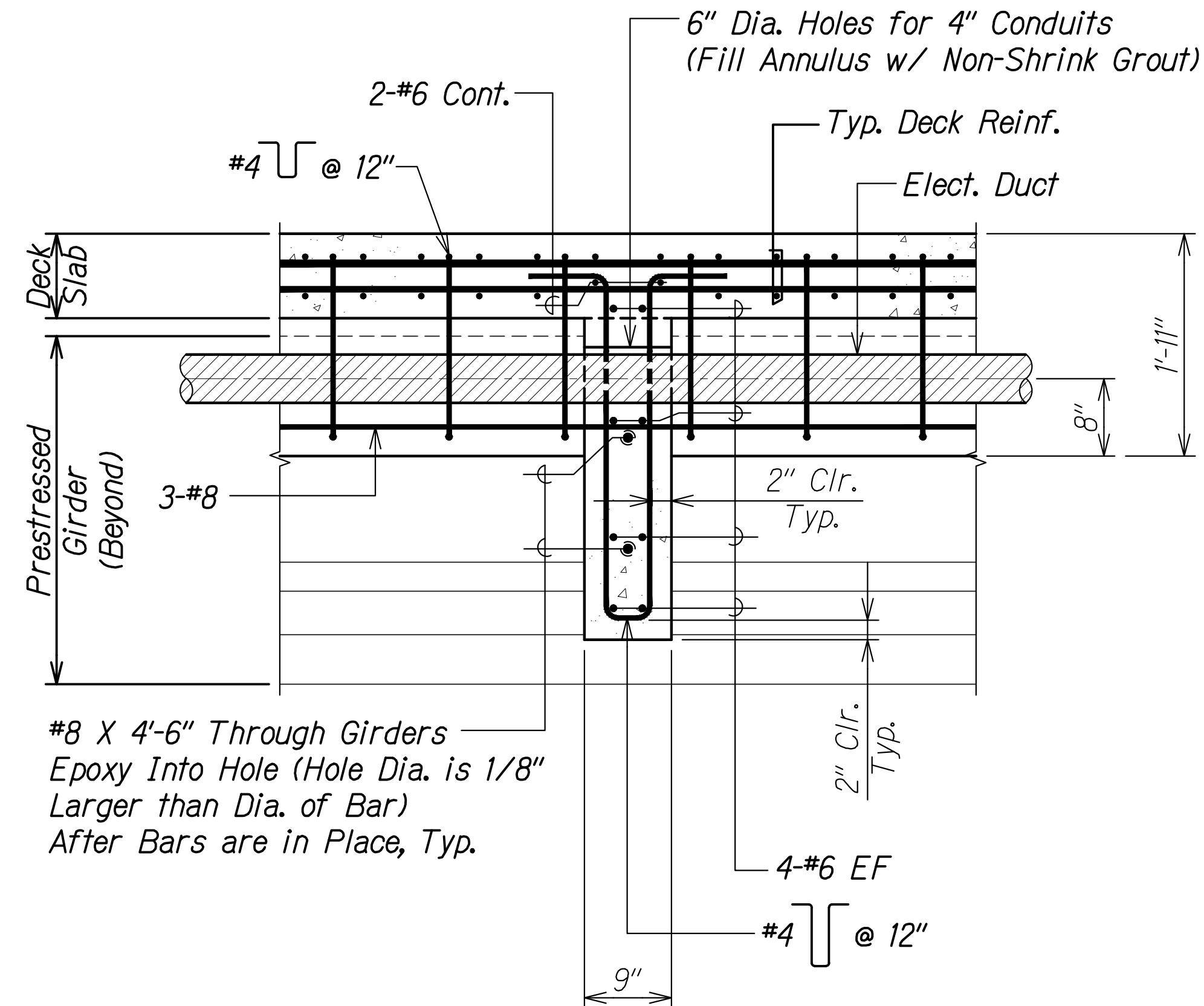
KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021
 SHEET No. S5.1A OF 3 SHEETS

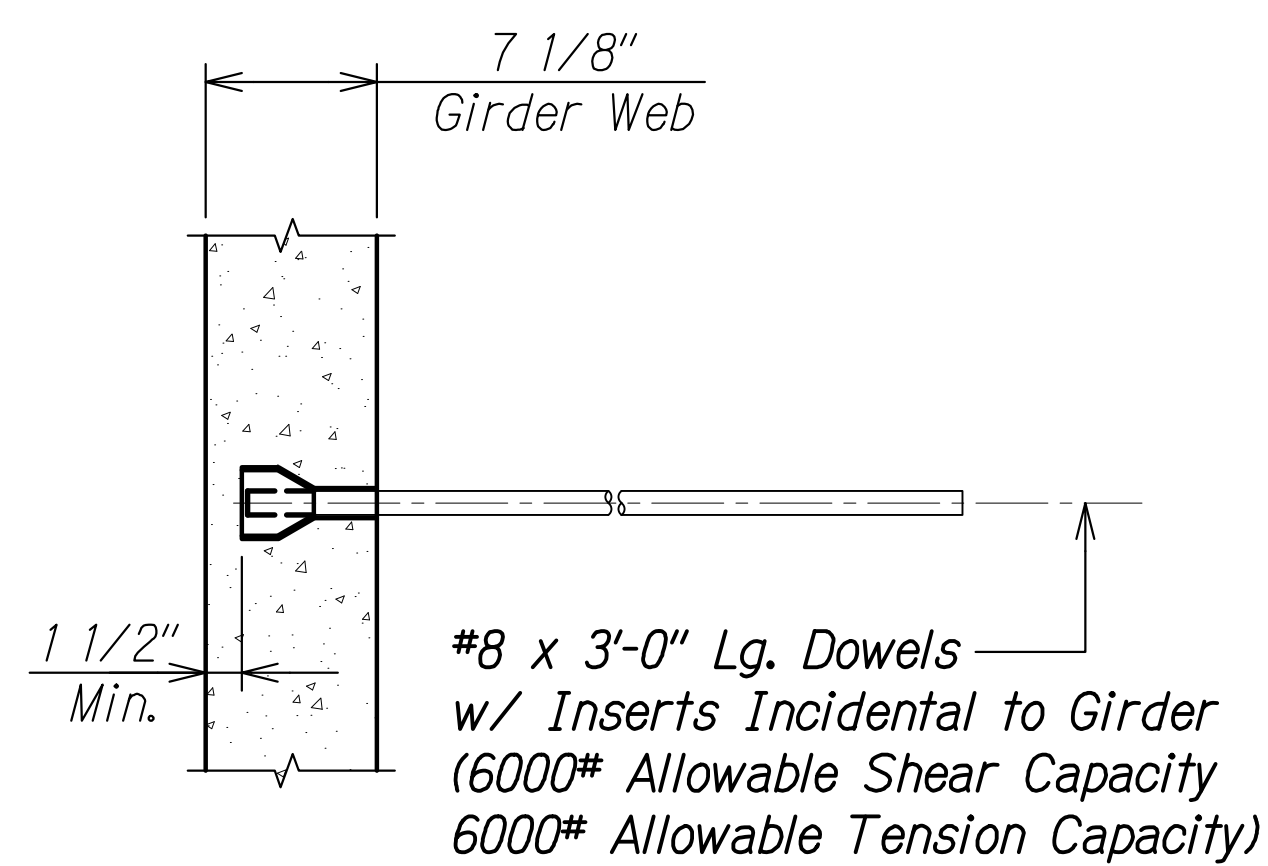
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| HAWAII | HAW. | BR-083-1(48) | 2021 | 96 | 161 |



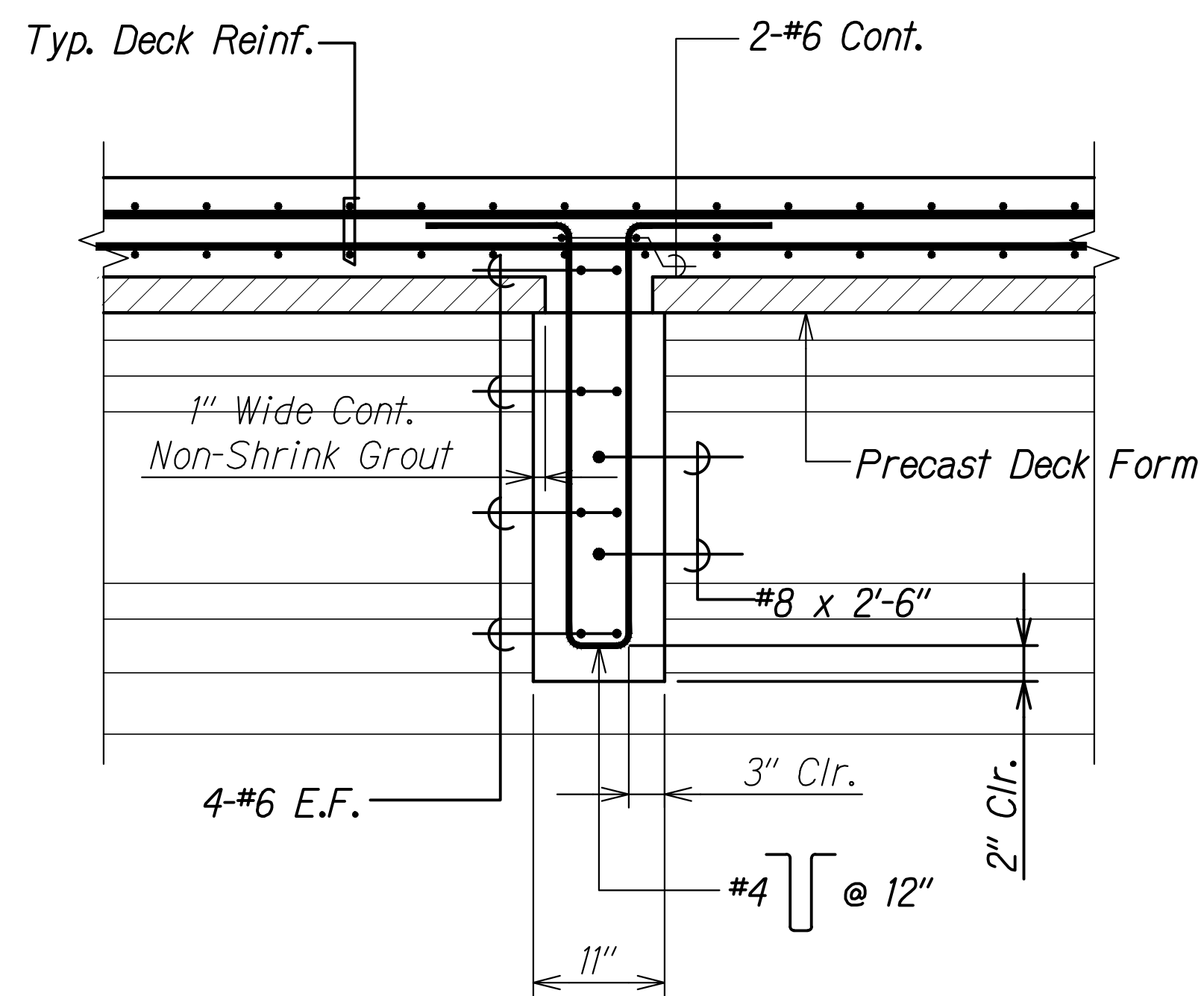
DIAPHRAGM SECTION A
Scale: 1" = 1'-0"
S5.1 | S5.2
S5.1A



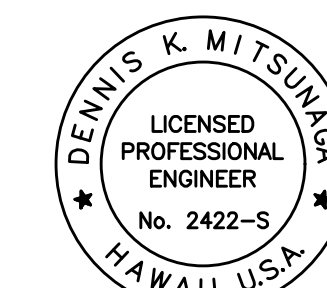
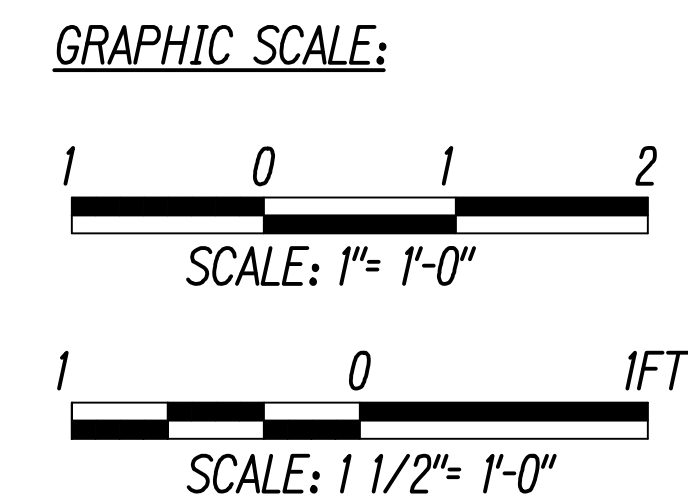
DIAPHRAGM SECTION AT ELECTRICAL DUCT B
Scale: 1" = 1'-0"
S5.1 | S5.2



TYPICAL INSERT DETAIL 1
Scale: 1 1/2" = 1'-0"
S5.1 | S5.2
S5.1A



DIAPHRAGM "B" SECTION C
Scale: 1" = 1'-0"
S5.1 | S5.2



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HIGHWAYS DIVISION

DIAPHRAGM SECTIONS AND DETAIL

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

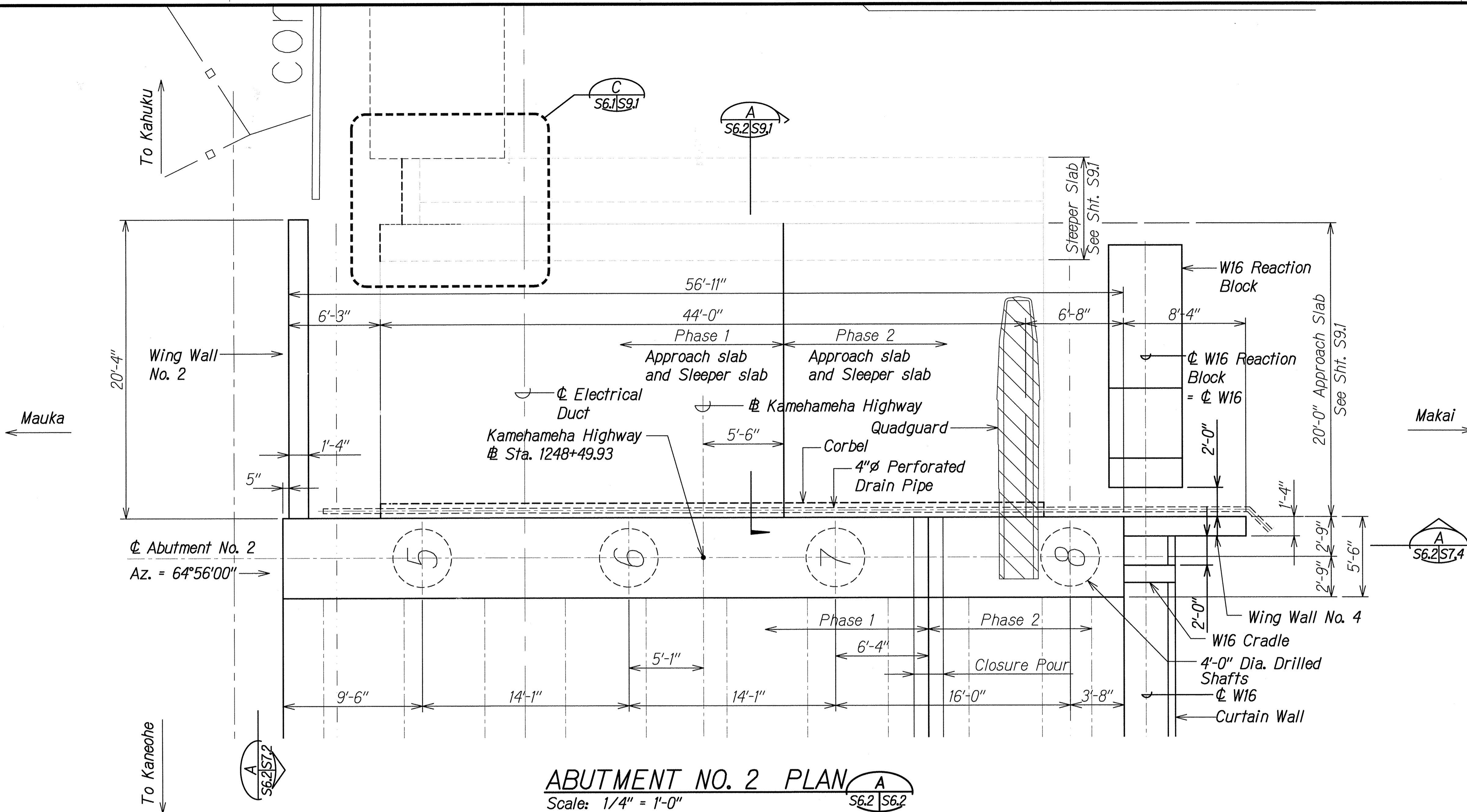
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SHEET No. S5.2 OF 3 SHEETS

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| NO. _____ | _____ |
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| QUANTITIES BY _____ | |
| DATE _____ | |

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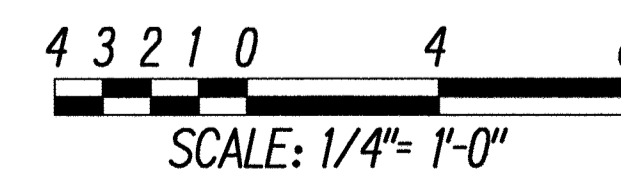


ABUTMENT NO. 2 PLAN
 Scale: 1/4" = 1'-0"

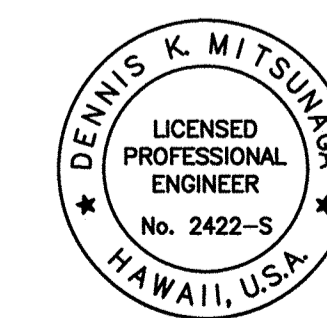
Note:

- Balance of W16 cradles are not shown for clarity, See Sheets S11.1 and S11.1A for details.
- Contractor shall submit locations of W16 Cradles. Contractor shall coordinate W16 Cradle locations with precast girder manufacturer, deck reinforcing, wing reinforcing and abutment reinforcing.
- 4" Diameter perforated drain pipe shall be included in the cost for structural backfill.

GRAPHIC SCALE:



APPROVED: _____ MAY 24 2021
 Manager and Chief Engineer, BWS (for work affecting BWS facilities State R/W & BWS easements only)



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 HIGHWAYS DIVISION

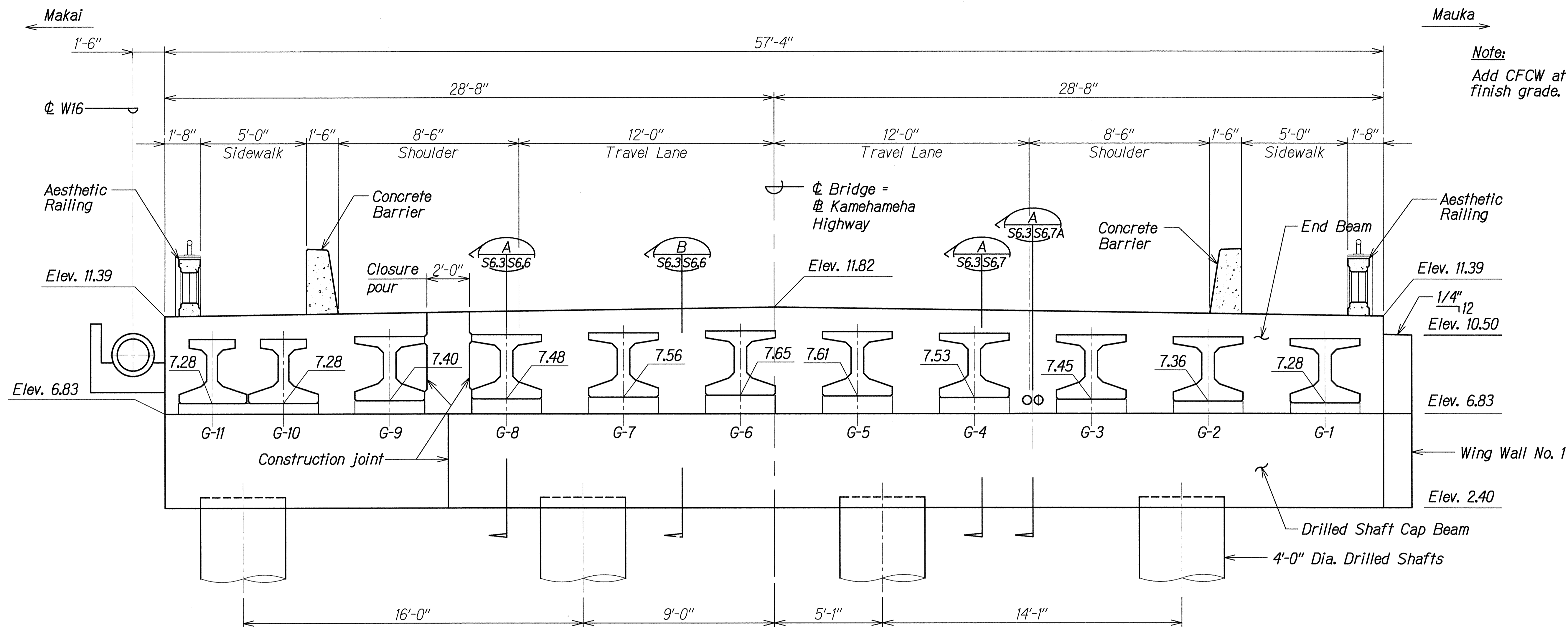
ABUTMENT NO. 2 PLAN

KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021
 SHEET No. S6.2 OF 14 SHEETS

| | |
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| ORIGINAL PLAN | DATE |
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| NOTE BOOK | |
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| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
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| HAWAII | HAW. | BR-083-1(48) | 2021 | 99 | 161 |

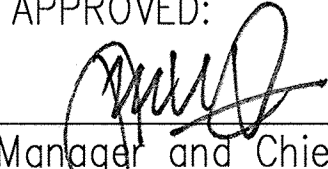


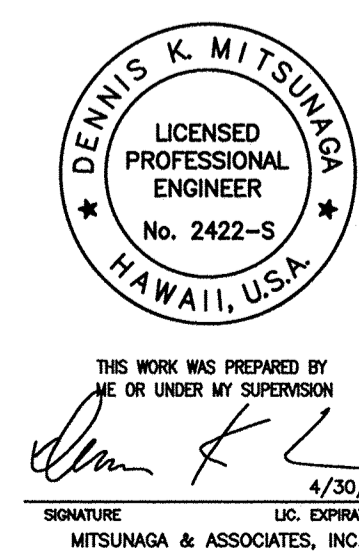
Note:
Add CFCW at all joints below finish grade.

ABUTMENT NO. 1 ELEVATION A
Scale: 3/8" = 1'-0" S6.3 | S6.3

GRAPHIC SCALE:
2 0 2 4 FT
SCALE: 3/8" = 1'-0"

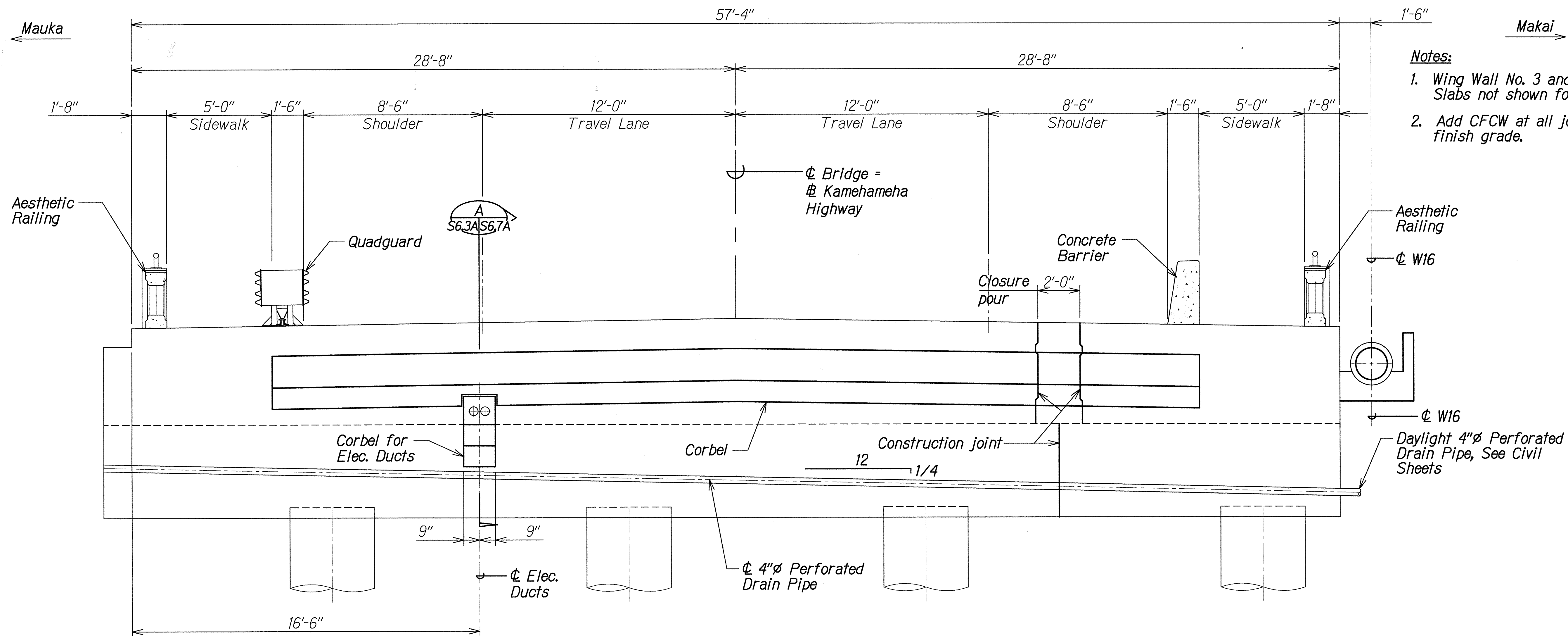
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| CHECKED BY | |
| ORIGINAL PLAN No. | |

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
ABUTMENT NO. 1 ELEVATION
KAMEHAMEHA HIGHWAY
Kaipapua Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)
Scale: As Noted Date: February 2021
SHEET No. S6.3 OF 14 SHEETS

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| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 100 | 161 |

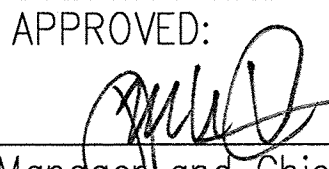


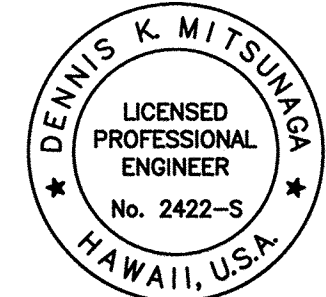
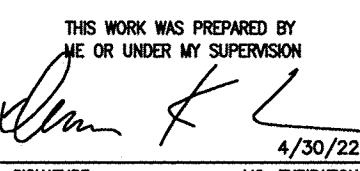
- Notes:**
1. Wing Wall No. 3 and Approach Slabs not shown for clarity.
 2. Add CFCW at all joints below finish grade.

ABUTMENT NO. 1 BACK ELEVATION A
 Scale: 3/8" = 1'-0" S6.3A | S6.3A

GRAPHIC SCALE:
 2 0 2 4FT
 SCALE: 3/8" = 1'-0"

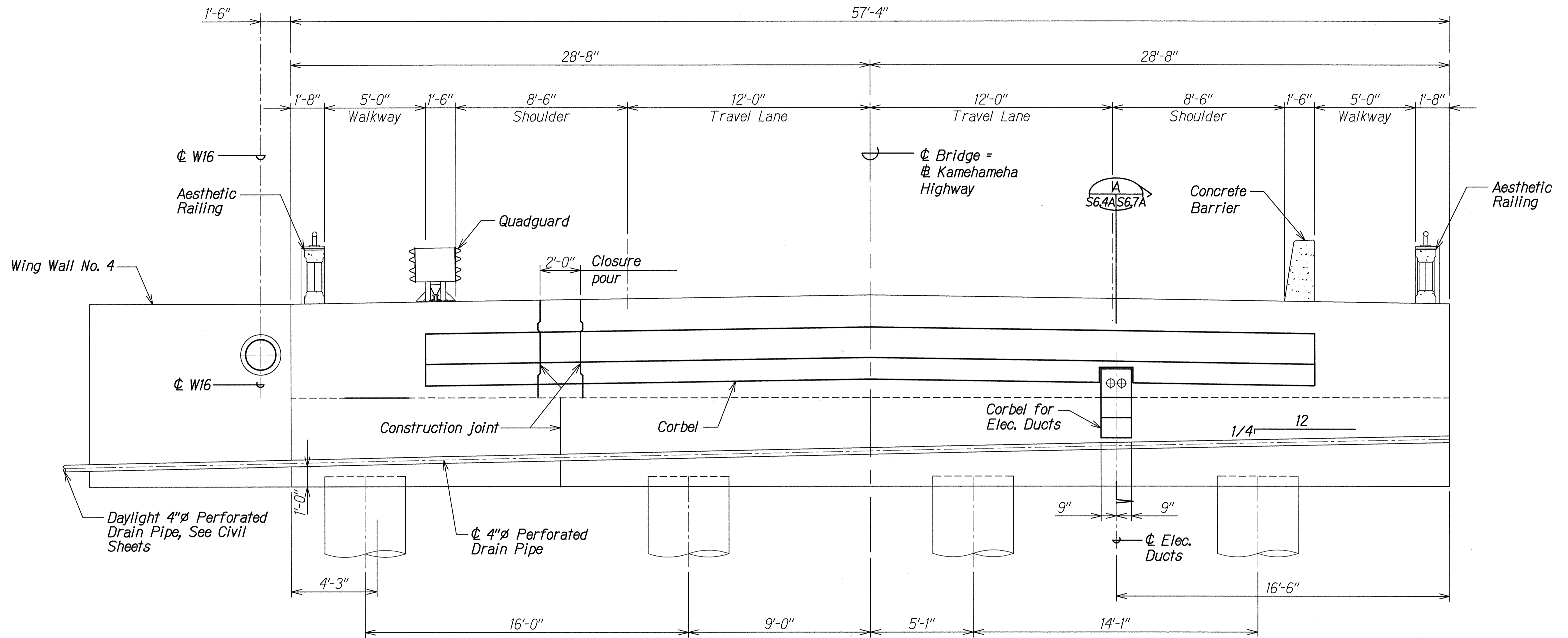
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| ORIGINAL PLAN | DATE |
| NO. _____ | _____ |
| DESIGNED BY _____ | CHECKED BY _____ |
| QUANTITIES BY _____ | |
| TRACED BY _____ | |
| DRAWN BY _____ | |
| DATE _____ | |

APPROVED:  DATE: MAY 24 2021
 Manager and Chief Engineer, BWS (for work affecting BWS facilities State R/W & BWS easements only)


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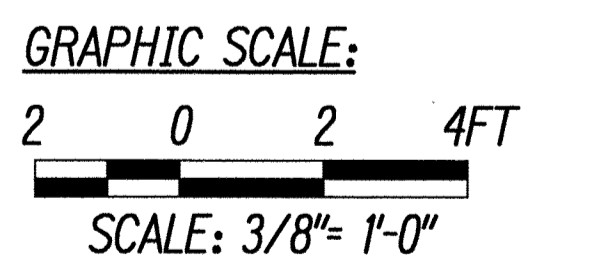
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
ABUTMENT NO. 1
BACK ELEVATION
KAMEHAMEHA HIGHWAY
Kaipapua Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)
 Scale: As Noted Date: February 2021
 SHEET No. S6.3A OF 14 SHEETS

| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-----------------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 102 | 161 |



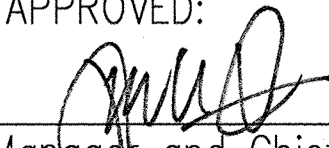
ABUTMENT NO. 2 BACK ELEVATION A
 Scale: 3/8" = 1'-0" S6.4A | S6.4A

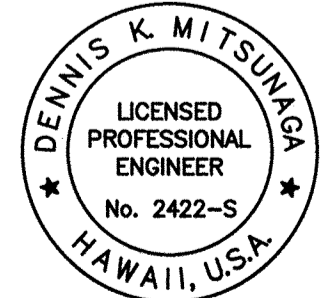
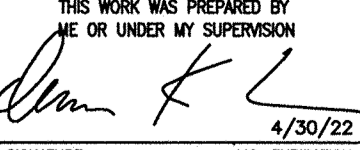
Note:
 Add CFCW at all joints below finish grade.



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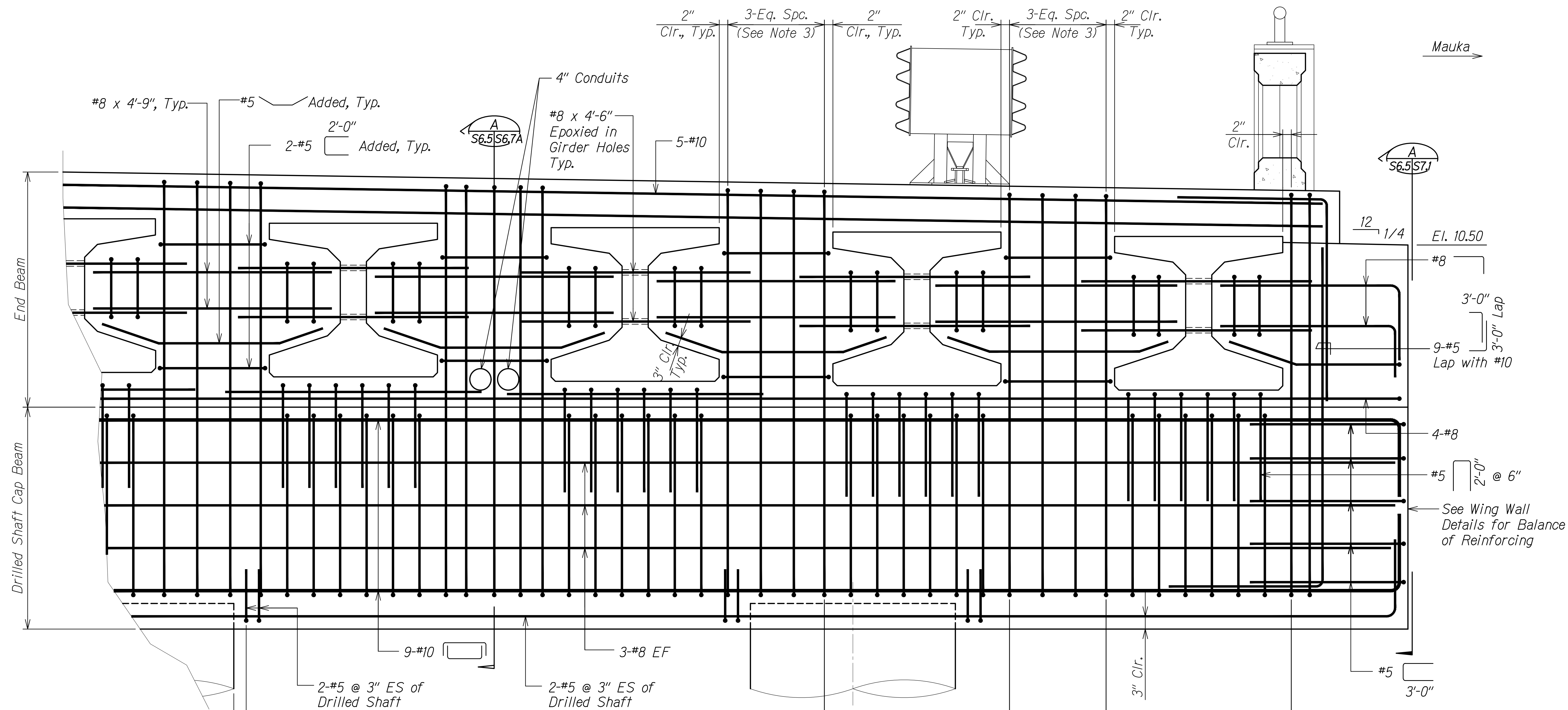
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APPROVED:  MAY 24 2021
 Manager and Chief Engineer, BWS DATE
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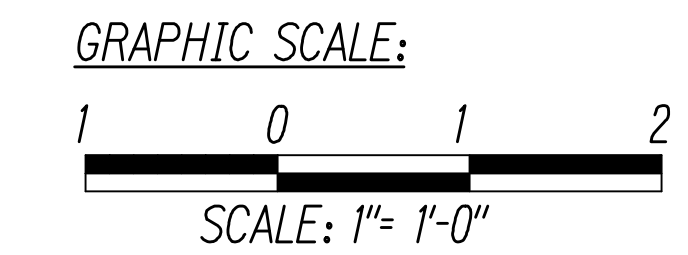
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
ABUTMENT NO. 2
BACK ELEVATION
KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)
 Scale: As Noted Date: February 2021
 SHEET No. **S6.4A** OF 14 SHEETS

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|---------------------|-------|-----------------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 103 | 161 |



- Notes:**
- Deck reinforcing not shown for clarity.
 - See Sheets S7.* for wing wall details.
 - Coordinate stirrup spacing with #6 deck reinforcing.

ELEVATION
 (Abutment No. 1 Shown) A
 Scale: 1" = 1'-0" S6.5 S6.5



DENNIS K. MITSUNAGA
 LICENSED PROFESSIONAL ENGINEER
 No. 2422-S
 HAWAII, U.S.A.

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 MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

ABUTMENT ELEVATION

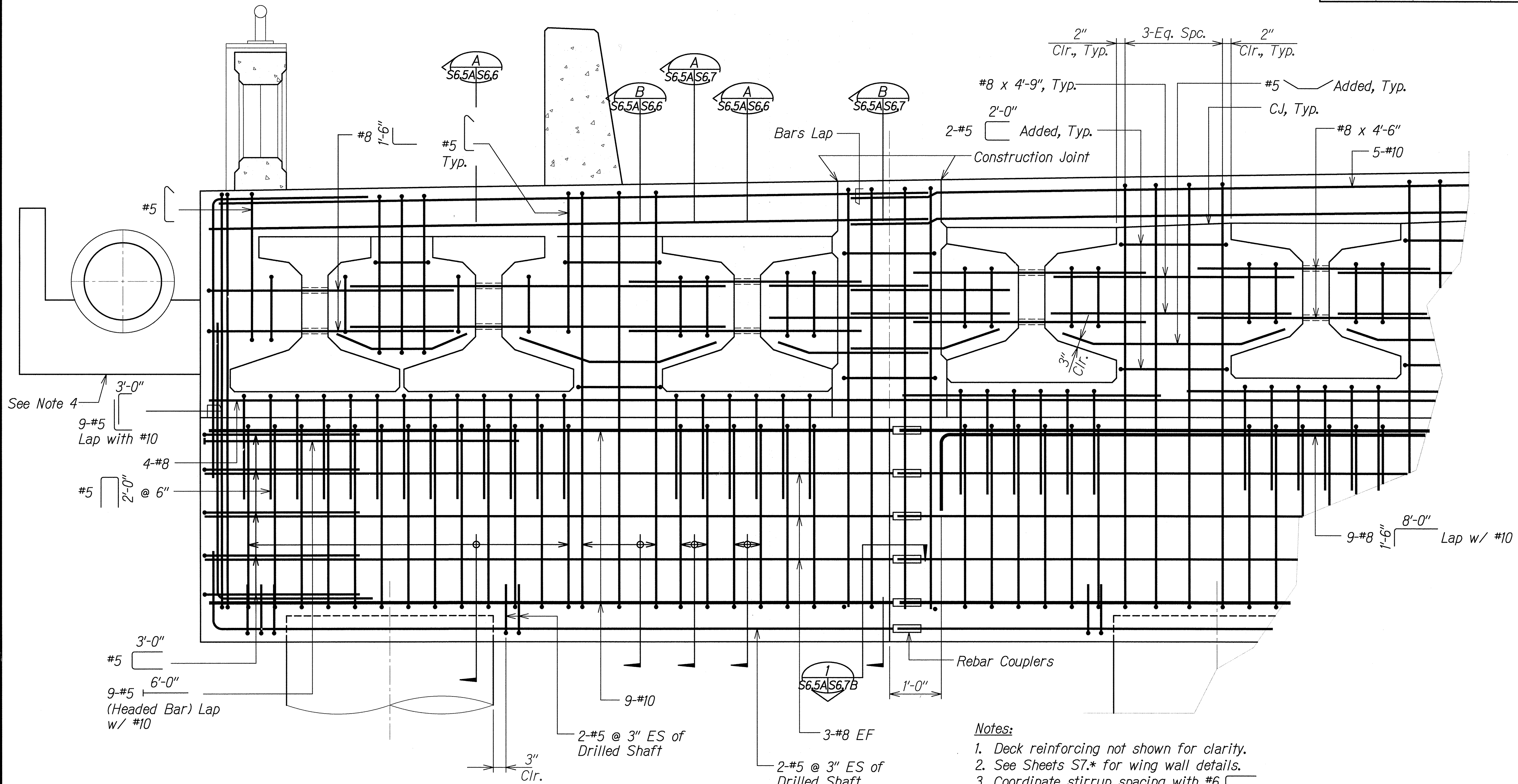
KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S6.5 OF 14 SHEETS

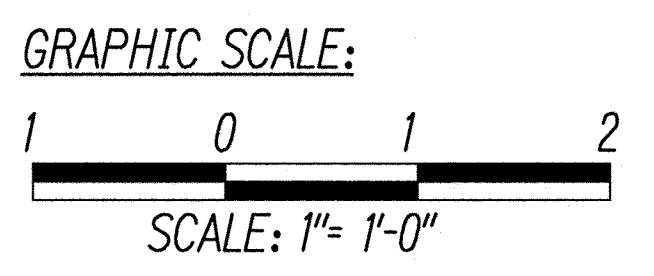
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| CHECKED BY | |
| QUANTITIES BY | |
| ORIGINAL PLAN No. | |

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ELEVATION
(Abutment No. 1 Shown)
 Scale: 1" = 1'-0"

A
 S6.5A S6.5A



APPROVED:
 Manager and Chief Engineer, BWS
 State R/W & BWS easements only

MAY 24 2021
 DATE

DENNIS K. MITSUNAGA
 LICENSED PROFESSIONAL ENGINEER
 No. 2422-S
 HAWAII, U.S.A.

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STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

ABUTMENT ELEVATION

KAMEHAMEHA HIGHWAY
Kaipapua Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

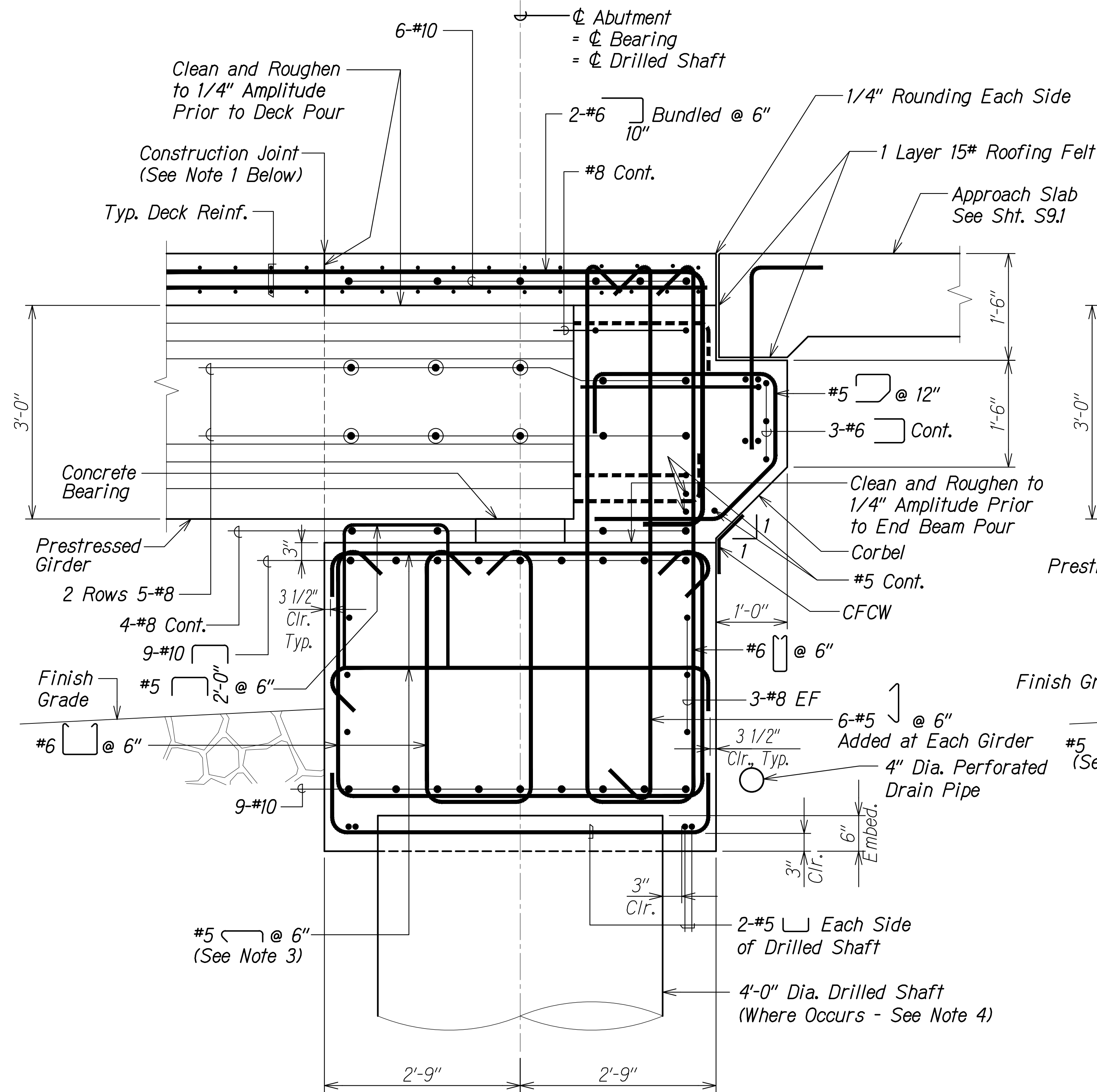
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SHEET No. S6.5A OF 14 SHEETS

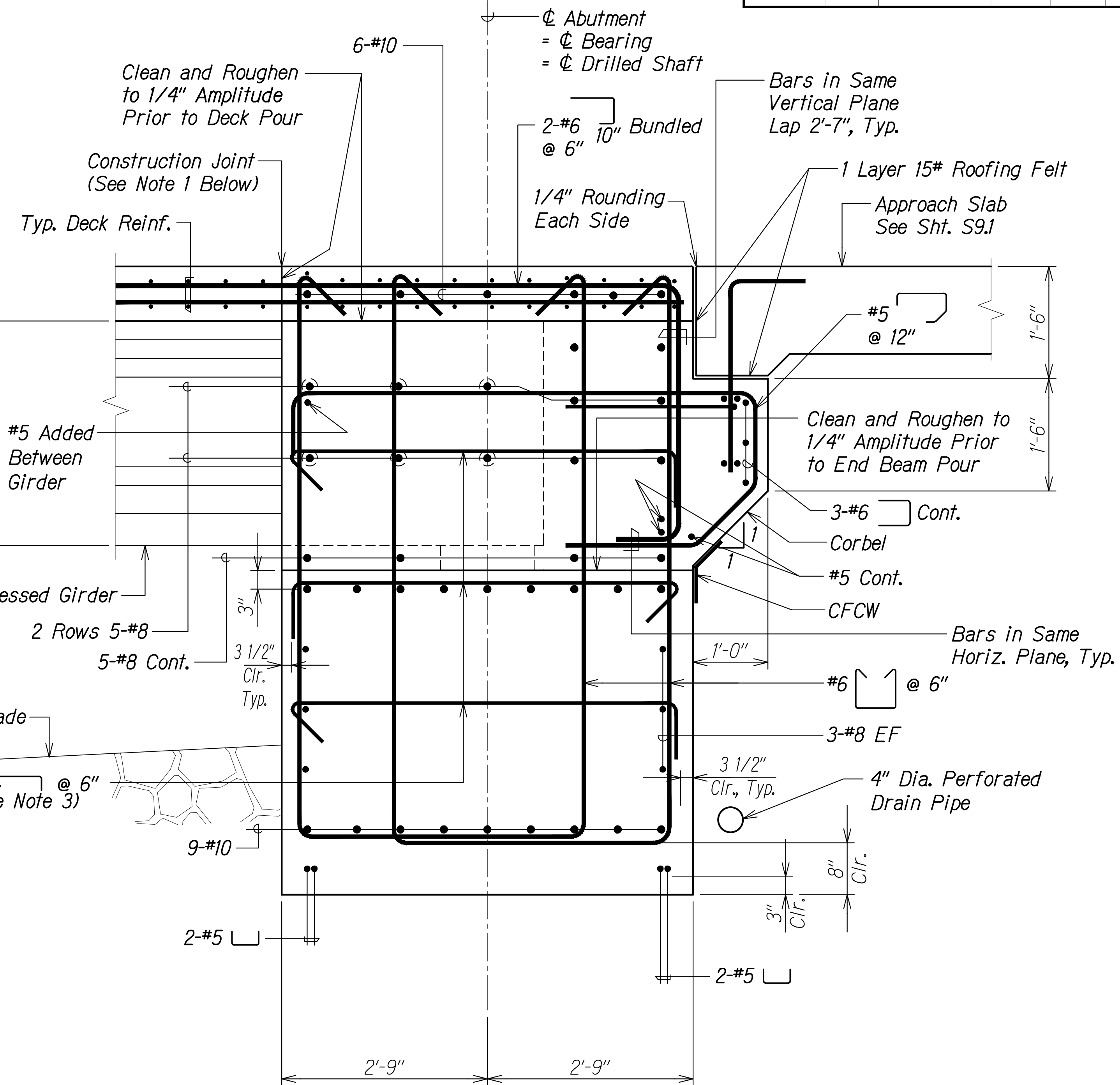
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| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-----------------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 105 | 161 |



SECTION AT GIRDER A
Scale: 1" = 1'-0"
S6.4, S6.5A

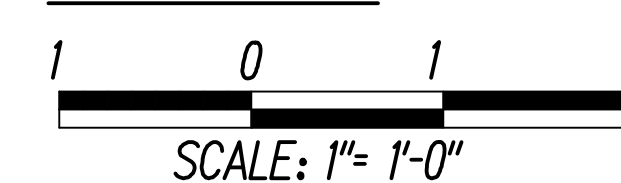


SECTION BETWEEN GIRDERS B
Scale: 1" = 1'-0"
S6.3, S6.6

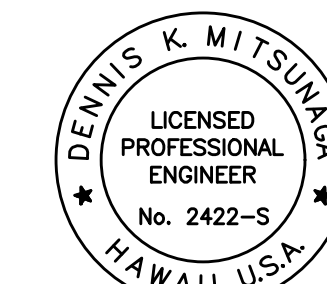
Notes:

1. Apply bonding agent such as Dural prep A.C., Armatec 110 Epocem or approved equal to Vertical deck deck joint prior to pouring deck section over end beam.
2. See Sheet S6.8 for concrete bearing details.
3. #5 tie at middepth of drilled shaft cap beam is not required at drilled shaft spirals.
4. See sheet S8.1 and S8.2 for drilled shafts.

GRAPHIC SCALE:



S6.4, S6.5A



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SIGNATURE: [Signature] LIC. EXPIRATION: 4/30/22
MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ABUTMENT SECTIONS

**KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)**

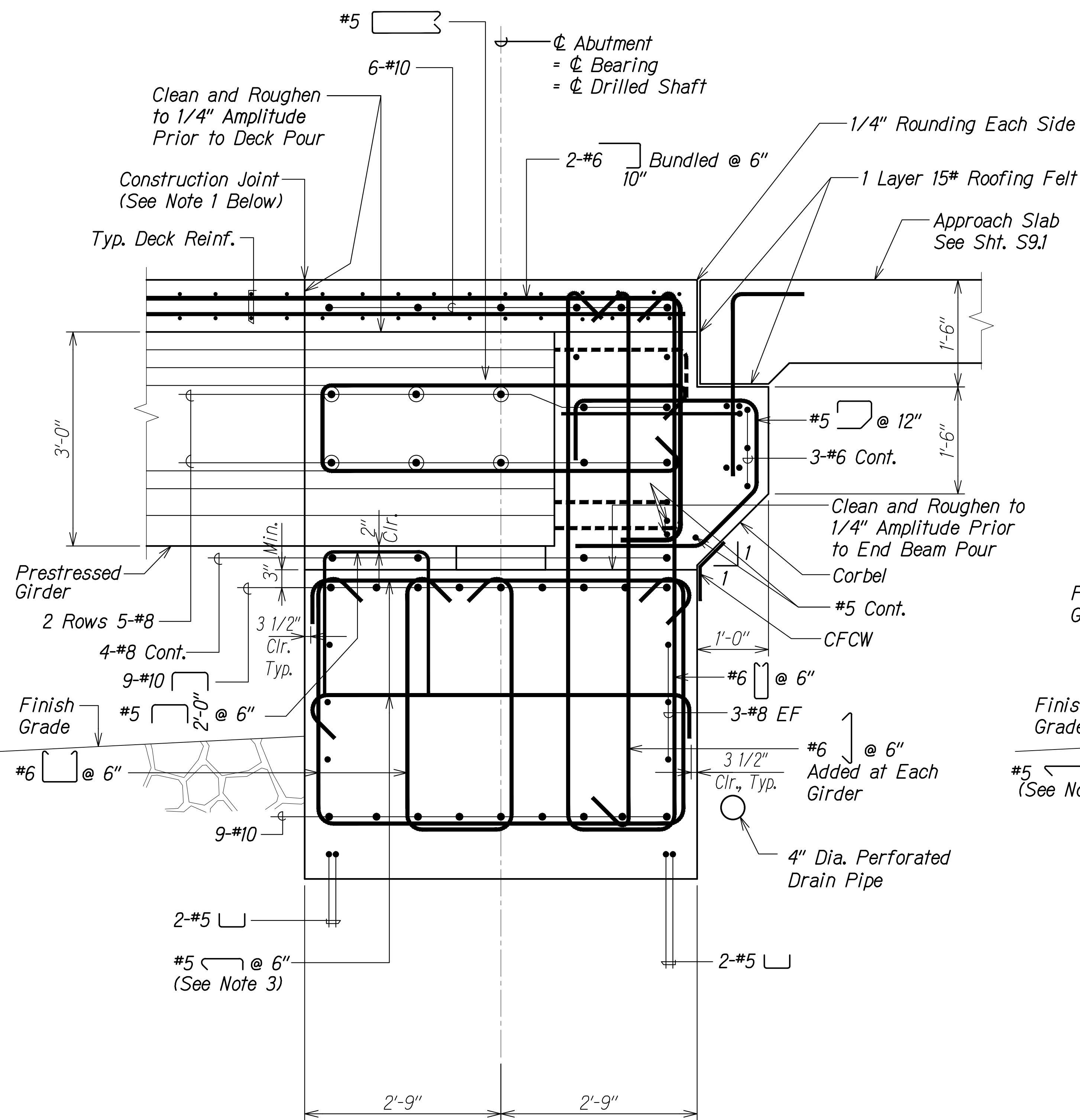
Scale: As Noted Date: February 2021

SHEET No. S6.6 OF 14 SHEETS

| | |
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| ORIGINAL PLAN | DATE |
| NO. | |

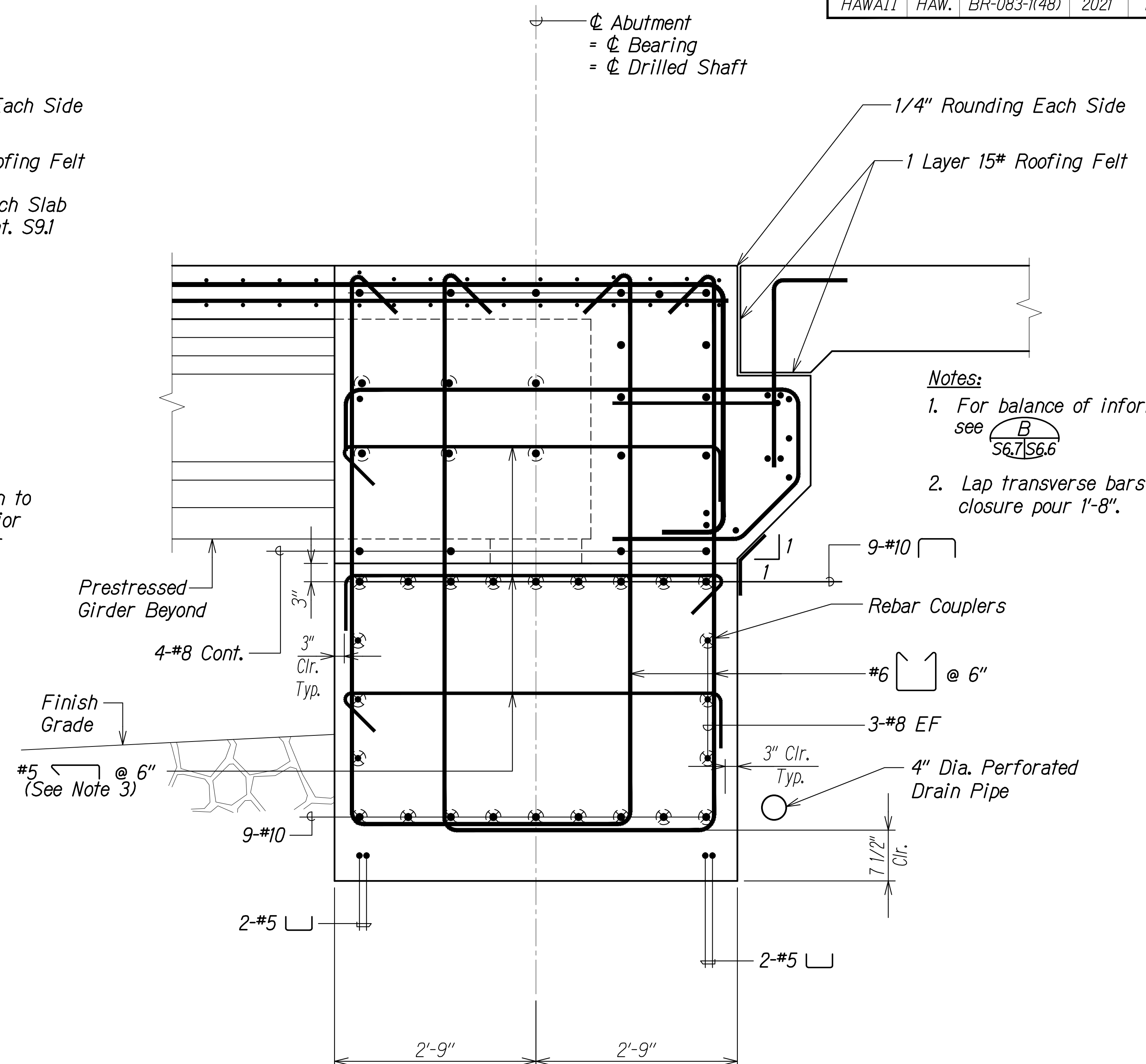
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| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-----------------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 106 | 161 |



SECTION AT GIRDER FLANGE
 Scale: 1" = 1'-0"
 S6.4, S6.5A

- Notes:**
1. Apply bonding agent such as Dural prep A.C., Armatec 110 Epocem or approved equal to Vertical deck deck joint prior to pouring deck section over end beam.
 2. See Sheet S6.8 for concrete bearing details.
 3. #5 tie at middepth of drilled shaft cap beam is not required at drilled shaft spirals.
 4. See sheet S8.1 and S8.2 for drilled shafts.

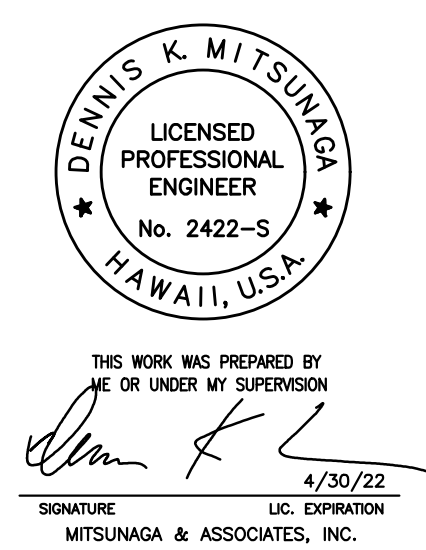
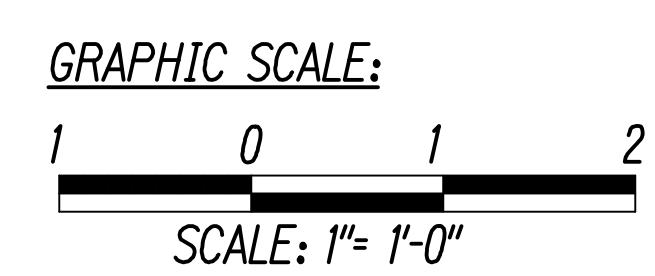


SECTION AT DRILLED SHAFT CAP BEAM CONSTRUCTION JOINT
 Scale: 1" = 1'-0"
 S6.5A, S6.7

- Notes:**
1. For balance of information see B S6.7/S6.6
 2. Lap transverse bars at closure pour 1'-8".

| | |
|-------------|------|
| DESIGNED BY | DATE |
| DRAWN BY | |
| CHECKED BY | |
| NO. | |

DRAWING NAME: I:\PROJECTS\13-01-KAIPAPAU BRIDGE\REVISED_STRUCT\13-01-KAIPAPAU BRIDGE_S6.5A.DWG PLOT TIME: 06-09-21, 3:24 PM



STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

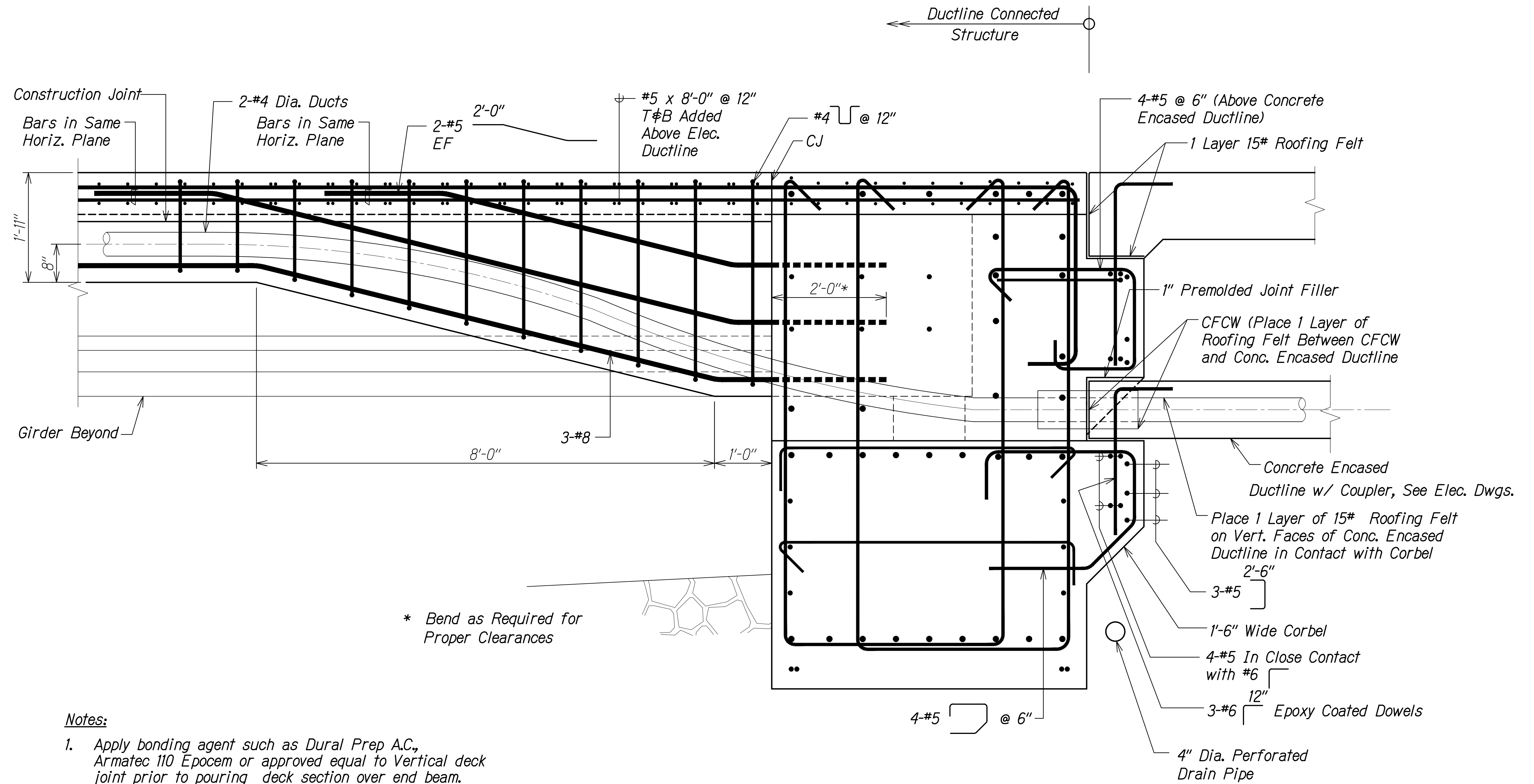
ABUTMENT SECTIONS

**KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)**

Scale: As Noted Date: February 2021

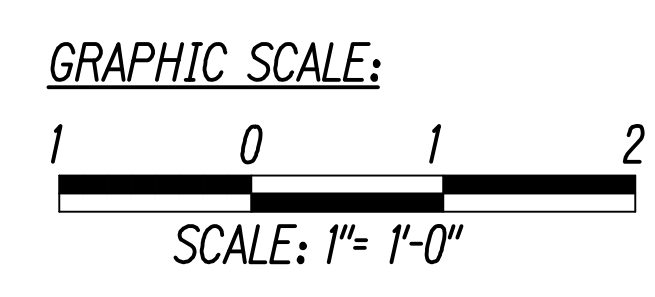
SHEET No. S6.7 OF 14 SHEETS

| | | | | | |
|---------------------|-------|-----------------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 107 | 161 |



- Notes:**
1. Apply bonding agent such as Dural Prep A.C., Armatec 110 Epocem or approved equal to Vertical deck joint prior to pouring deck section over end beam.
 2. For balance of reinforcing See Section B/S6.6.
 3. For upper corbel reinforcing and approach slab details see sht. S9.1.

SECTION AT ELECTRICAL DUCTLINE
 Scale: 1" = 1'-0"
 S6.3A, S6.4, S6.4A, S6.5



DENNIS K. MITSUNAGA
 LICENSED PROFESSIONAL ENGINEER
 No. 2422-S
 HAWAII, U.S.A.
 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
 SIGNATURE: [Signature]
 LIC. EXPIRATION: 4/30/22
 MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

ABUTMENT SECTION

KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)

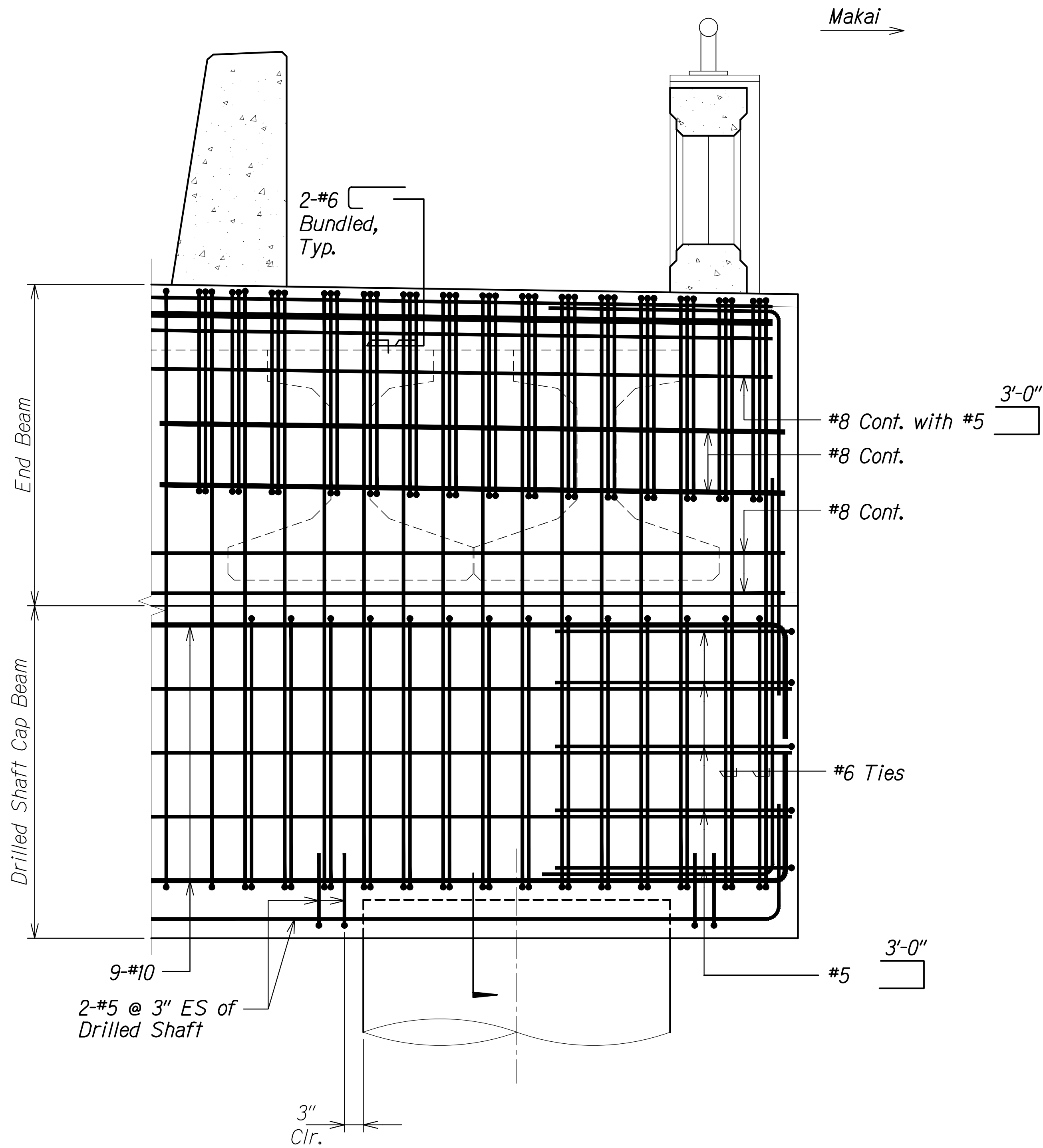
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SHEET No. S6.7A OF 14 SHEETS

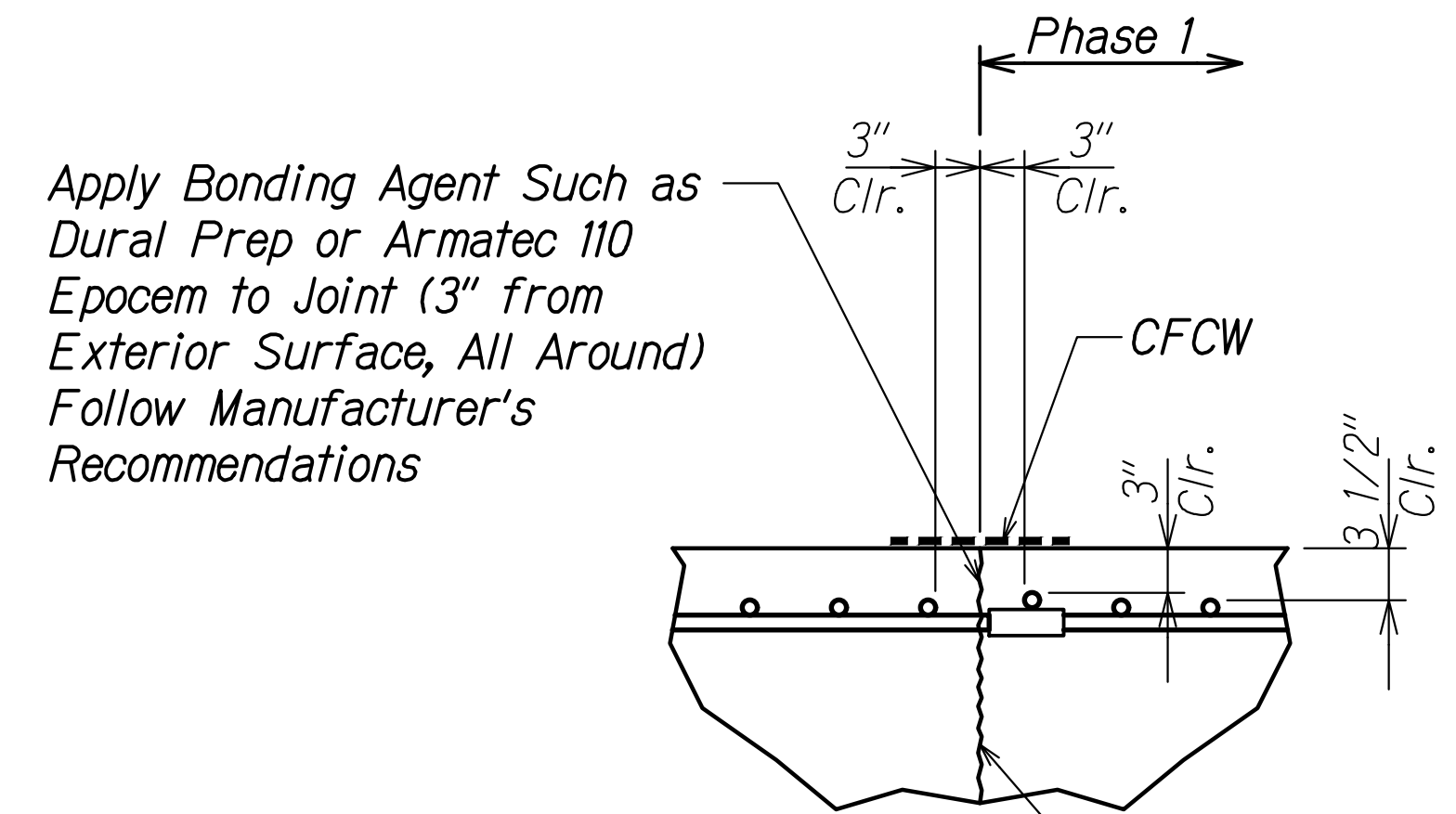
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| ORIGINAL PLAN | DATE |
| DESIGNED BY | |
| CHECKED BY | |
| NO. _____ | |

DRAWING NAME: I:\PROJECTS\ACTIVE FILES\13-01_KAIPAPAU BRIDGE\REVISED_STRUCTURE\051221\KSB-S606.DWG PLOT TIME: 06-09-21, 3:25 PM

| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
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| HAWAII | HAW. | BR-083-1(48) | 2021 | 108 | 161 |

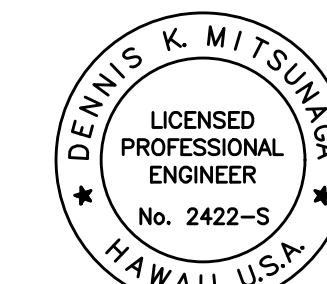
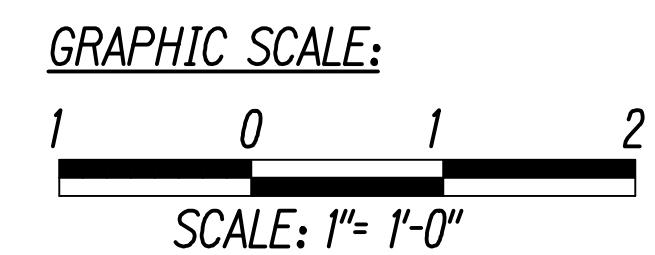


REAR ELEVATION (MAKAI SIDE)
 Scale: 1" = 1'-0"
 S6.7B | A | S6.7B



Note:
 Coupler shown in this detail is for illustrative purposes. Contractor shall submit details.

REBAR COUPLER DETAIL
 Scale: 1" = 1'-0"
 S6.5A | 1 | S1.3 | S6.7B



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
 Signature: *Dennis K. Mitsunaga*
 LIC. EXPIRATION: 4/30/22
 MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

ABUTMENT SECTION AND DETAIL

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)




Scale: As Noted Date: February 2021

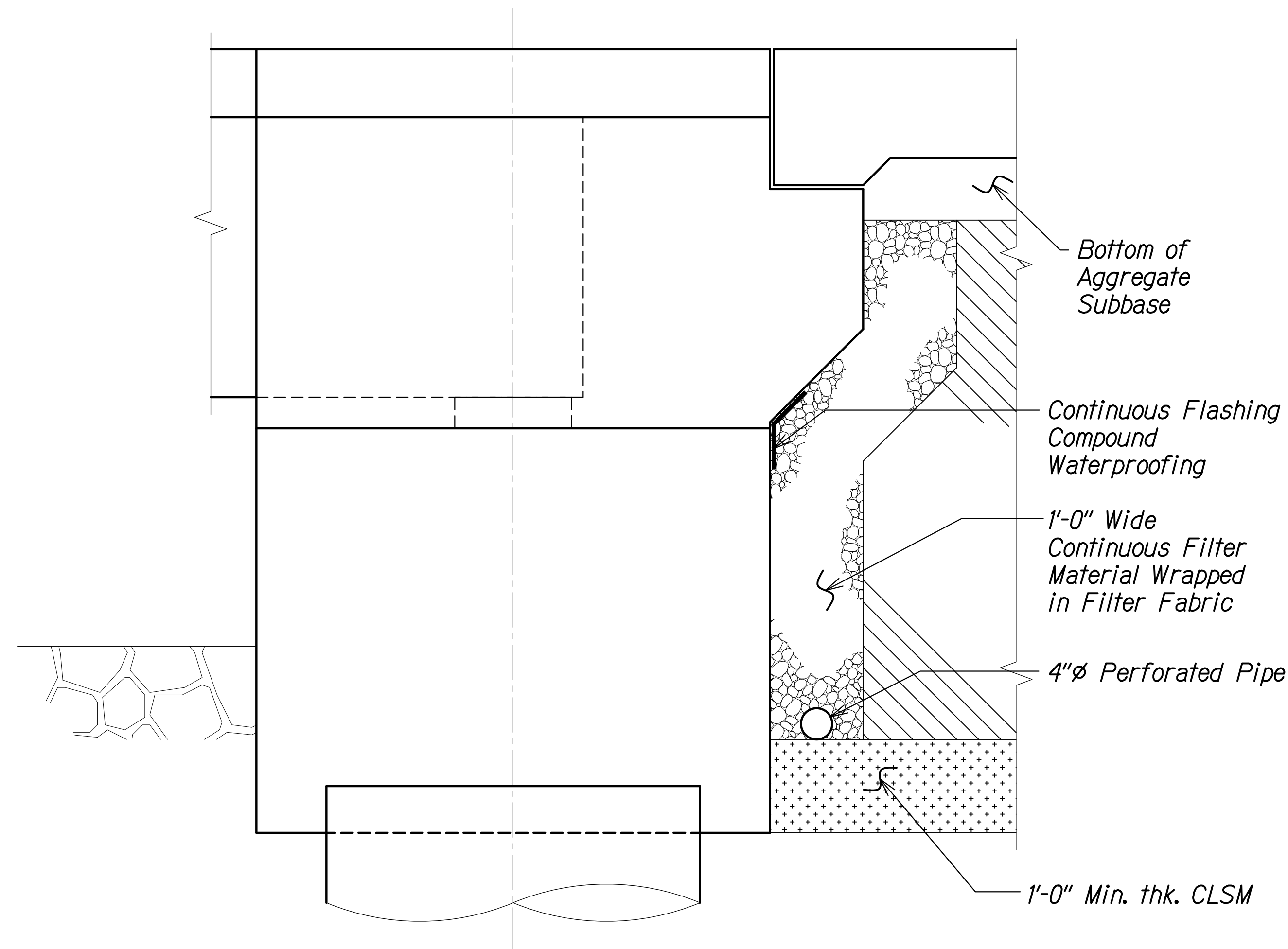
SHEET No. S6.7B OF 14 SHEETS

| | |
|---------------|------|
| ORIGINAL PLAN | DATE |
| DESIGNED BY | |
| CHECKED BY | |
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DRAWING NAME: T:\PROJECTS\ACTIVE FILES\13-01_KAIPAPAU BRIDGE\REVISED_STRUCT\13-01_KAIPAPAU BRIDGE_S6.7B.DWG PLOT TIME: 06-09-21, 3:25 PM

| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
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| HAWAII | HAW. | BR-083-1(48) | 2021 | 109 | 161 |

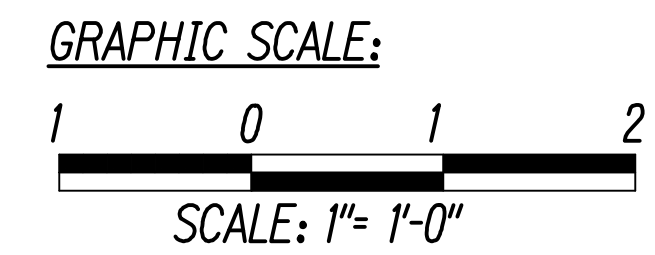
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-  Structure Backfill
 -  Filter Material
 -  Impervious Material

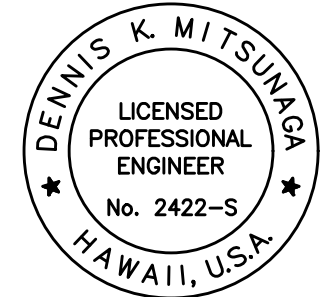
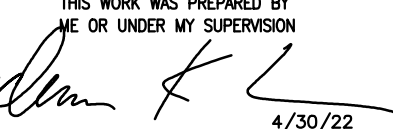


BACKFILL DETAIL 1
 Scale: 1" = 1'-0" S6.7C S6.7C

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|---------------|------|
| DESIGNED BY | DATE |
| DRAWN BY | |
| CHECKED BY | |
| QUANTITIES BY | |
| NO. | |

DRAWING NAME: T:\PROJECTS\ACTIVE FILES\13-01-KAIPAPAU BRIDGE\REVISED_STRUCT\13-051221\KSB-S606.DWG PLOT TIME: 06-09-21, 3:26 PM




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 SIGNATURE LIC. EXPIRATION
 MITSUNAGA & ASSOCIATES, INC. 4/30/22

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

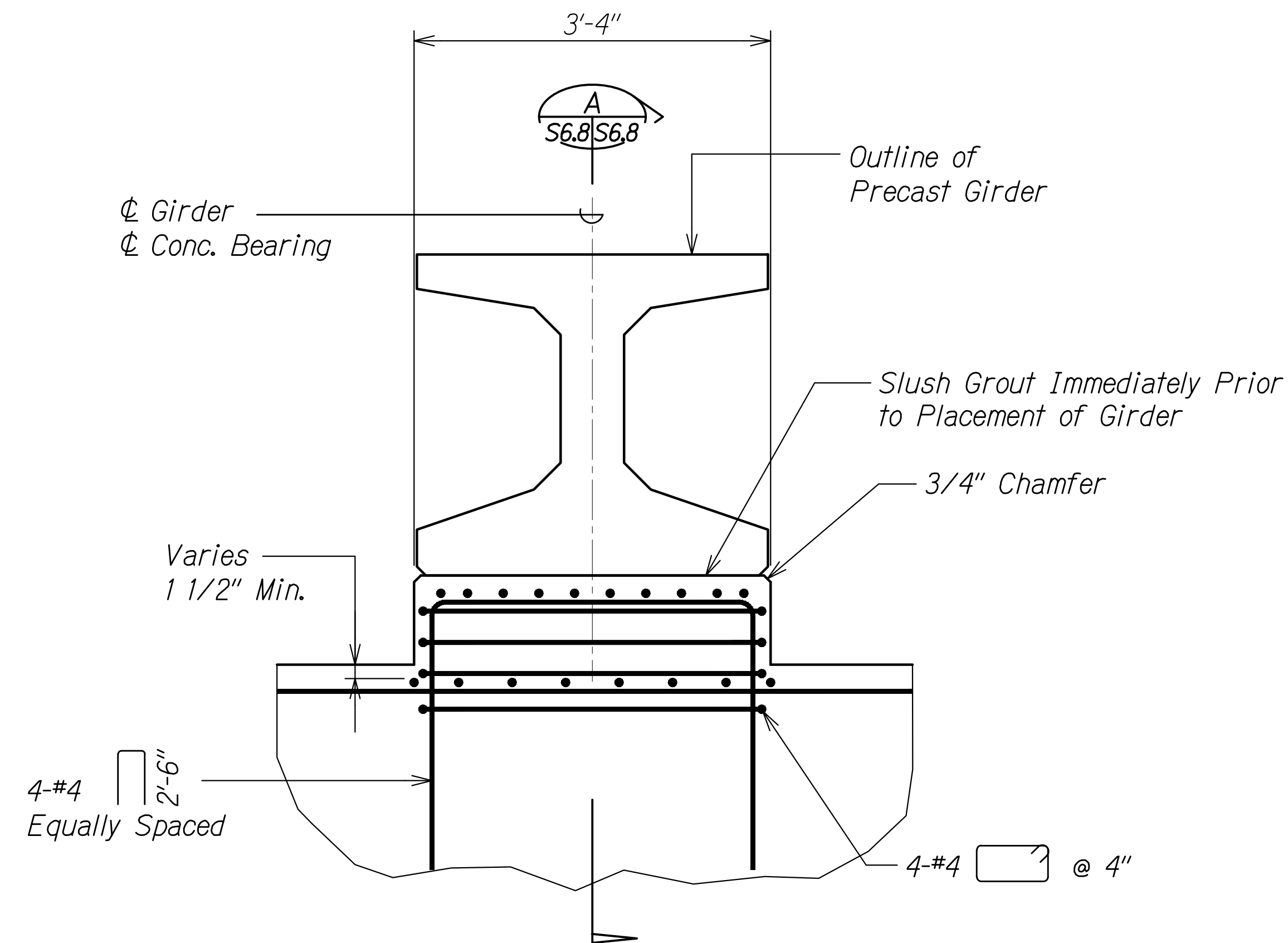
BACKFILL DETAIL

**KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)**

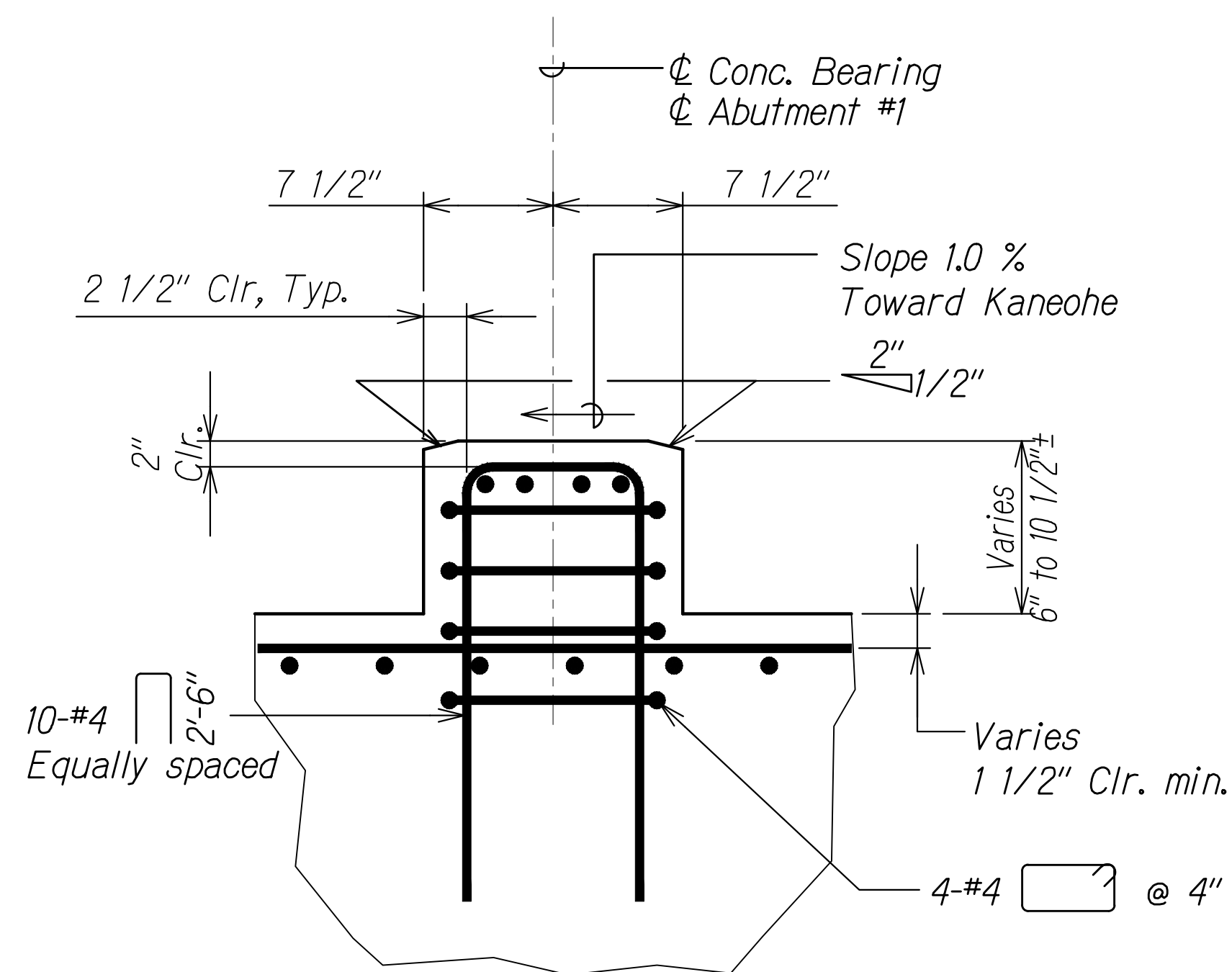
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SHEET No. S6.7C OF 14 SHEETS

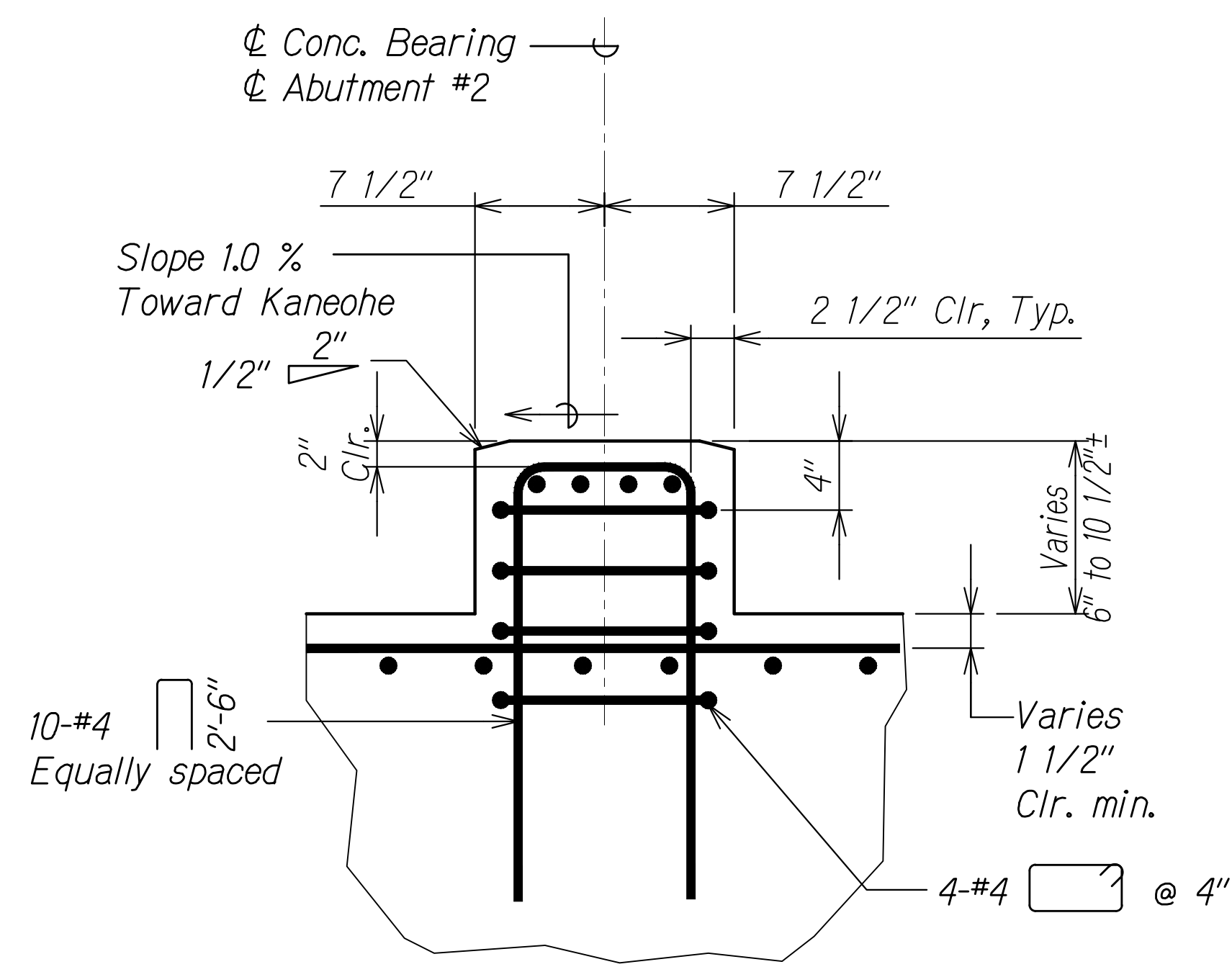
| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-----------------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 110 | 161 |



CONCRETE BEARING DETAIL 1
Scale: 1" = 1'-0" S6.8 | S6.8



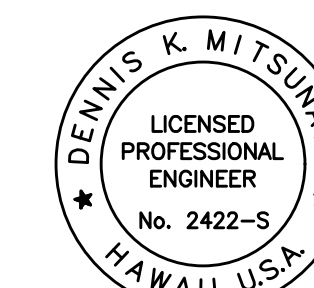
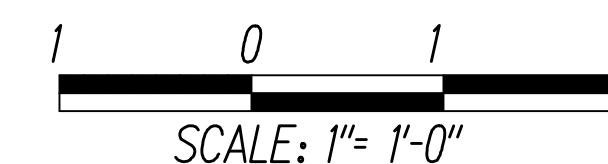
CONCRETE BEARING AT ABUTMENT NO. 1



CONCRETE BEARING AT ABUTMENT NO. 2

SECTION A
Scale: 1 1/2" = 1'-0" S8.8 | S6.8

GRAPHIC SCALES:



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
SIGNATURE: *Dennis K. Mitsunaga* LIC. EXPIRATION: 4/30/22
MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONCRETE BEARING DETAIL

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

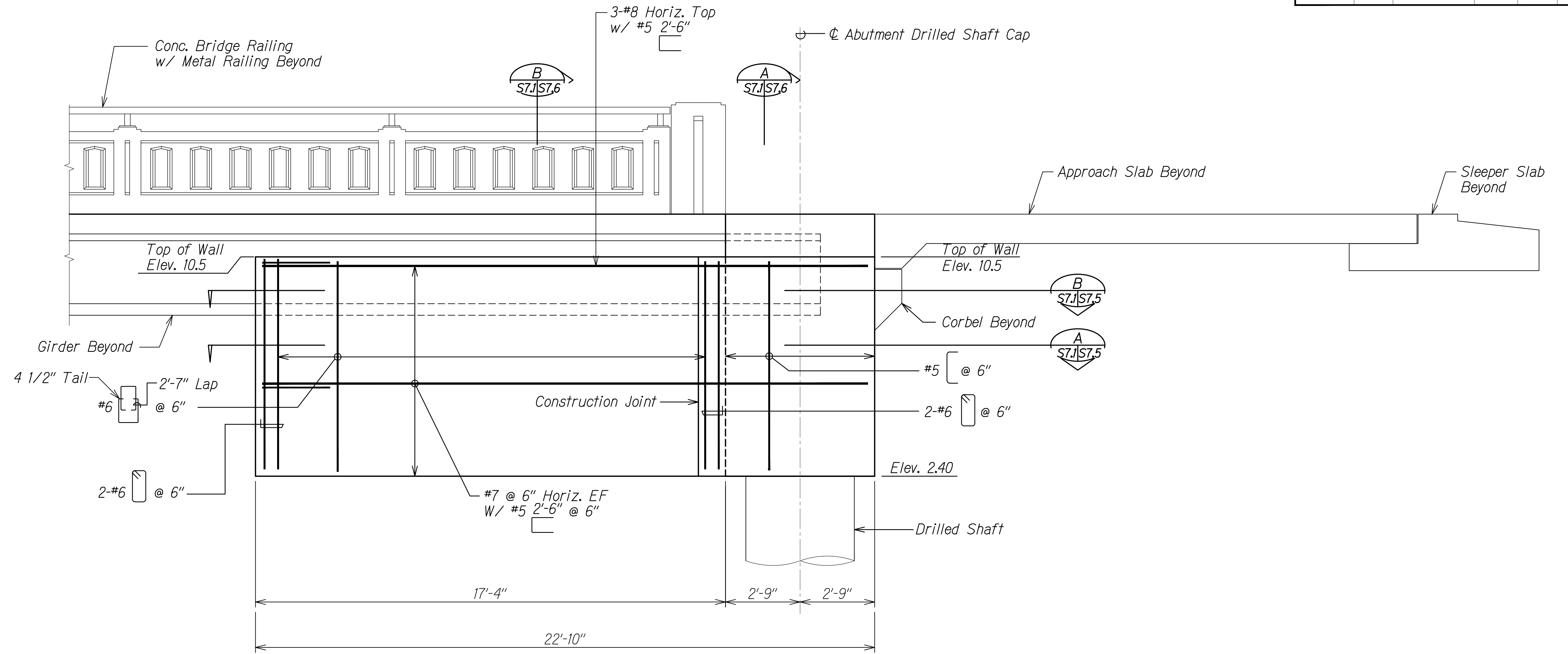
Scale: As Noted Date: February 2021

SHEET No. S6.8 OF 14 SHEETS

| | |
|---------------|------|
| ORIGINAL PLAN | DATE |
| DESIGNED BY | |
| CHECKED BY | |
| NO. | |

DRAWING NAME: I:\PROJECTS\ACTIVE FILES\13-01_KAIPAPAU BRIDGE\REVISED_STRUCTURE\S6.8-S6.8.DWG PLOT TIME: 06-09-21, 3:27 PM

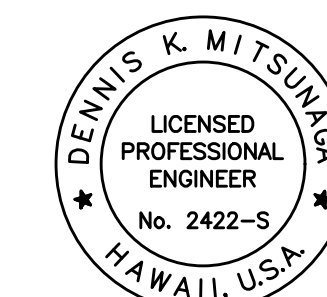
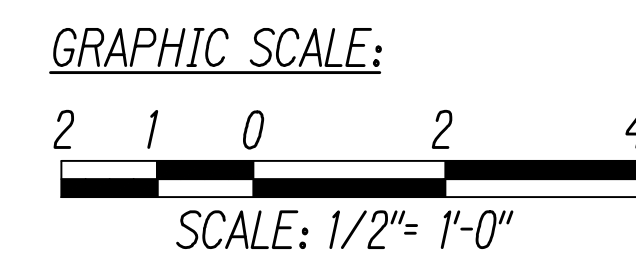
| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-----------------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 111 | 161 |



WING WALL NO. 1 ELEVATION
 Scale: 1/2" = 1'-0"
 A
 S6.1 | ST.1
 S6.5

| | |
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| DESIGNED BY | DATE |
| DRAWN BY | |
| CHECKED BY | |
| QUANTITIES BY | |
| NOTED BY | |
| NO. | |

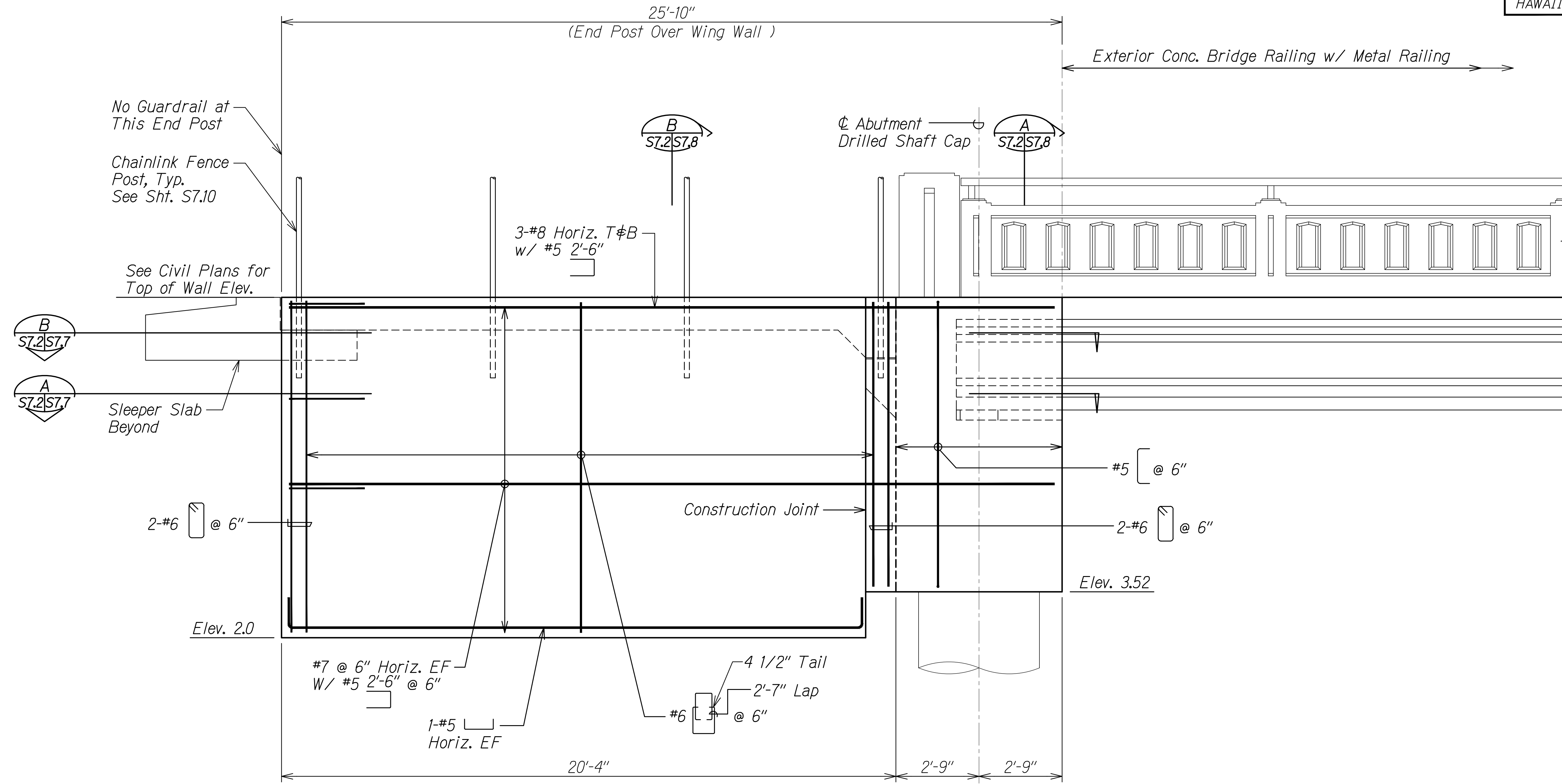
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 SIGNATURE: *[Signature]* LIC. EXPIRATION: 4/30/22
 MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
WING WALL NO. 1
ELEVATION
 KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)
 Scale: As Noted Date: February 2021
 SHEET No. *ST.1* OF 11 SHEETS

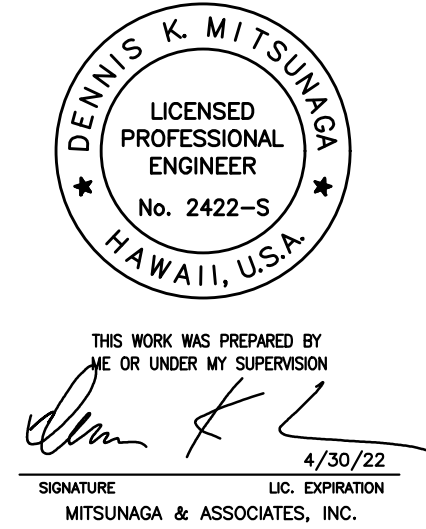
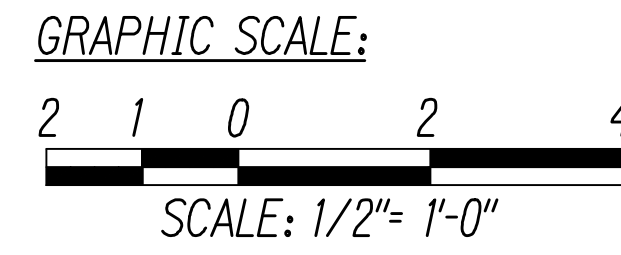
| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-----------------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 112 | 161 |



WING WALL NO. 2 ELEVATION
 Scale: 1/2" = 1'-0" A
S6.2 | S7.2

| | |
|---------------|------|
| ORIGINAL PLAN | DATE |
| DESIGNED BY | |
| CHECKED BY | |
| NO. BOOK | |
| QUANTITIES BY | |
| CHECKED BY | |

DRAWING NAME: T:\PROJECTS\ACTIVE FILES\13-01-KAIPAPAU BRIDGE\REVISED_STRUCT\13-051221\KSB-S701.DWG PLOT TIME: 06-09-21, 3:28 PM



STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

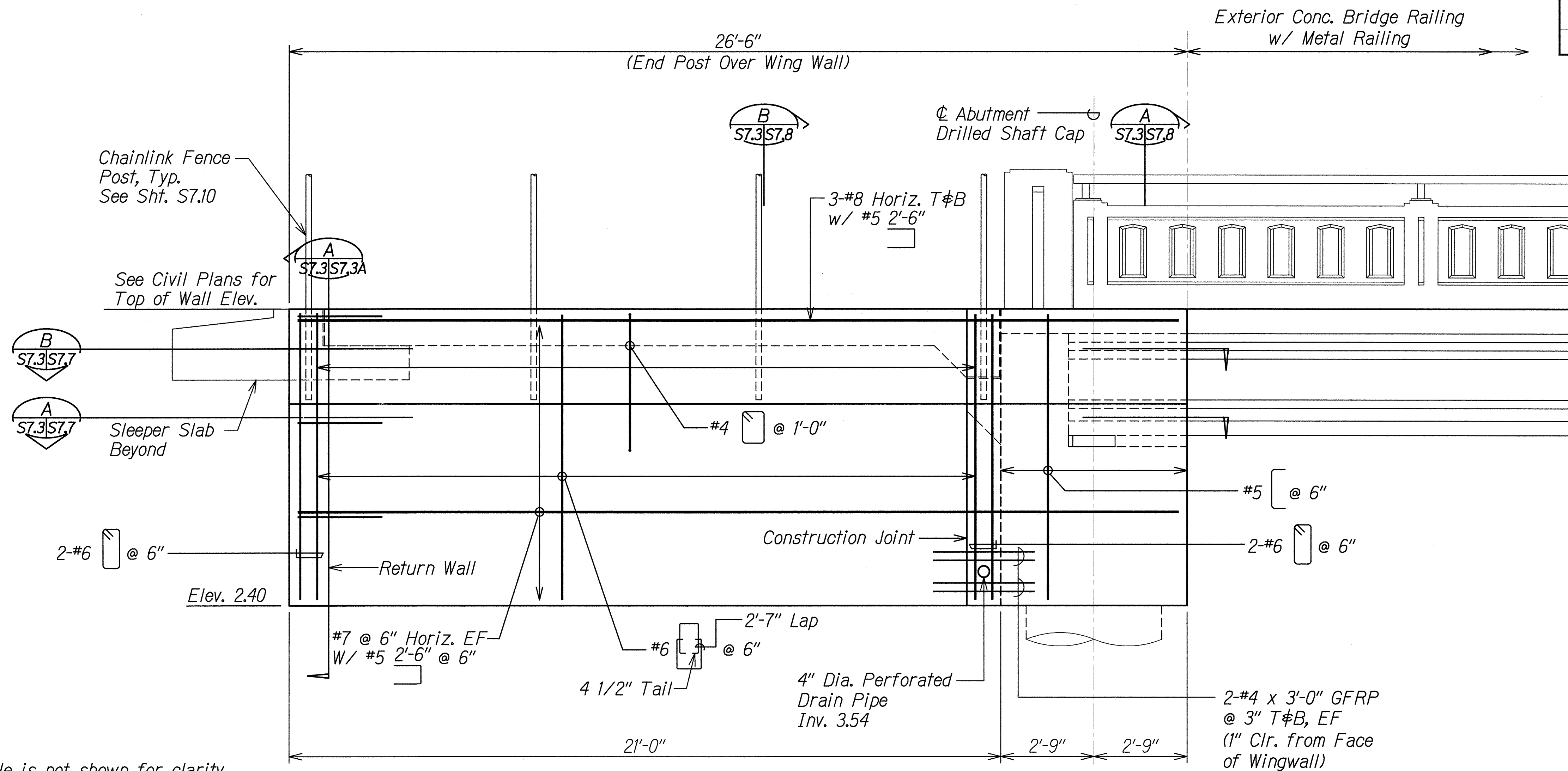
WING WALL NO. 2
ELEVATION

KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S7.2 OF 11 SHEETS

| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-----------------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 113 | 161 |



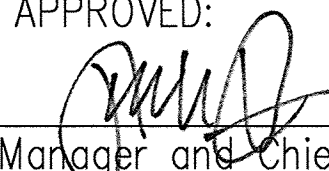
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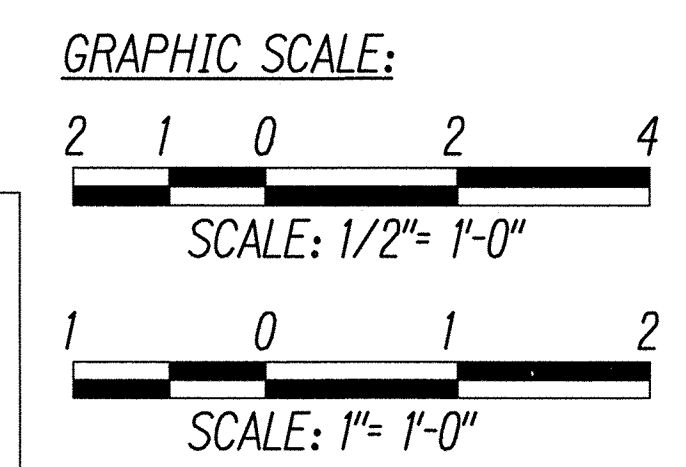
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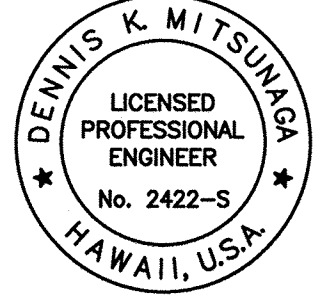
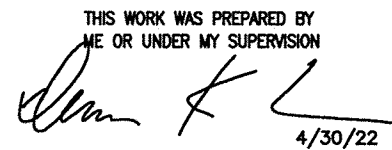
WING WALL NO. 3 ELEVATION
 Scale: 1/2" = 1'-0" A
S6.1 | S7.3

| ORIGINAL PLAN | DATE |
|-------------------|------|
| SURVEY PLOTTED BY | |
| DRAWN BY | |
| DESIGNED BY | |
| QUANTITIES BY | |
| CHECKED BY | |

DRAWING NAME: T:\PROJECTS\ACTIVE FILES\13-01- KAIAPAU BRIDGE\REVISED STRUCT\13-05121\WSP-S703.DWG PLOT TIME: 05-20-21, 11:30 AM

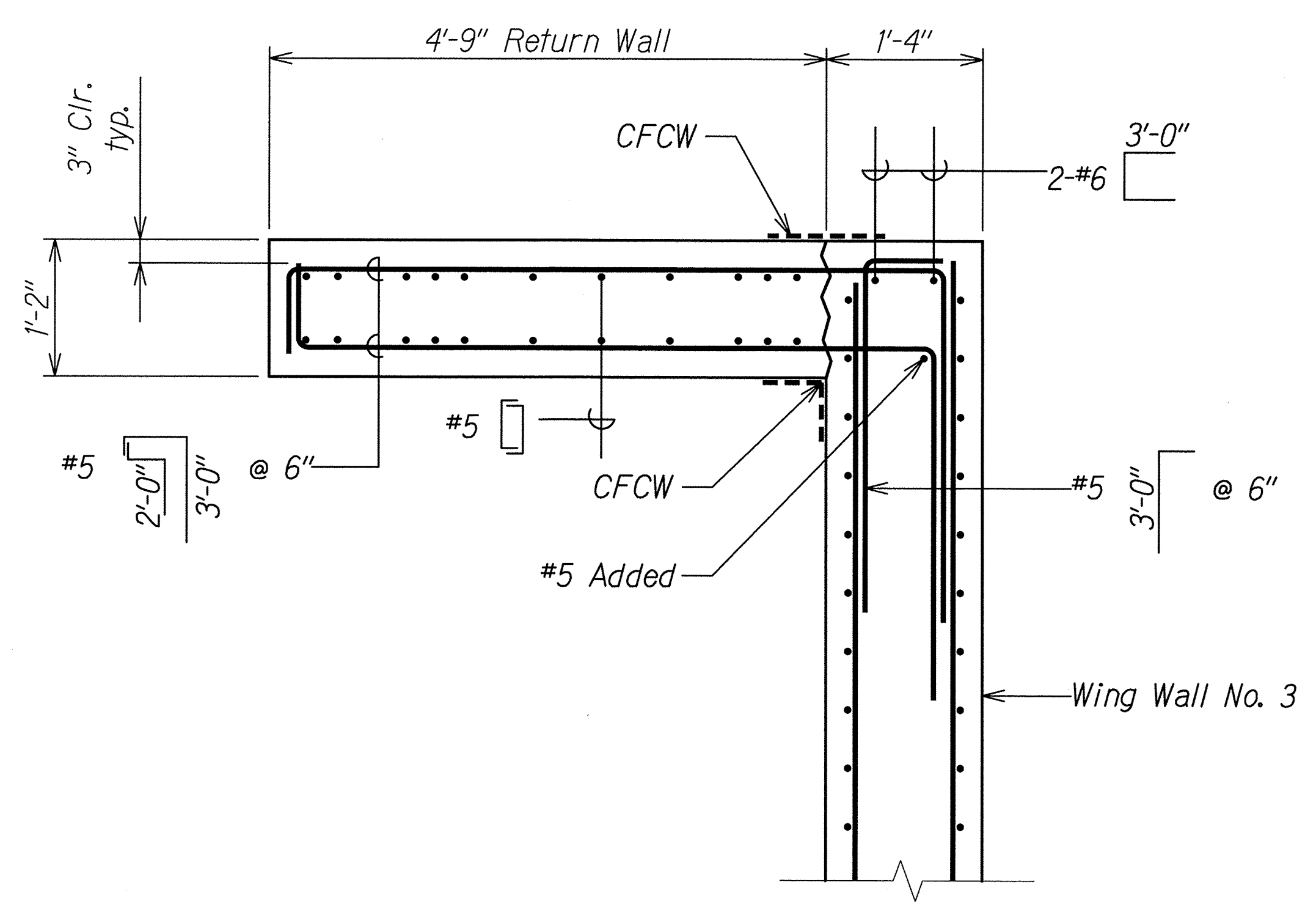
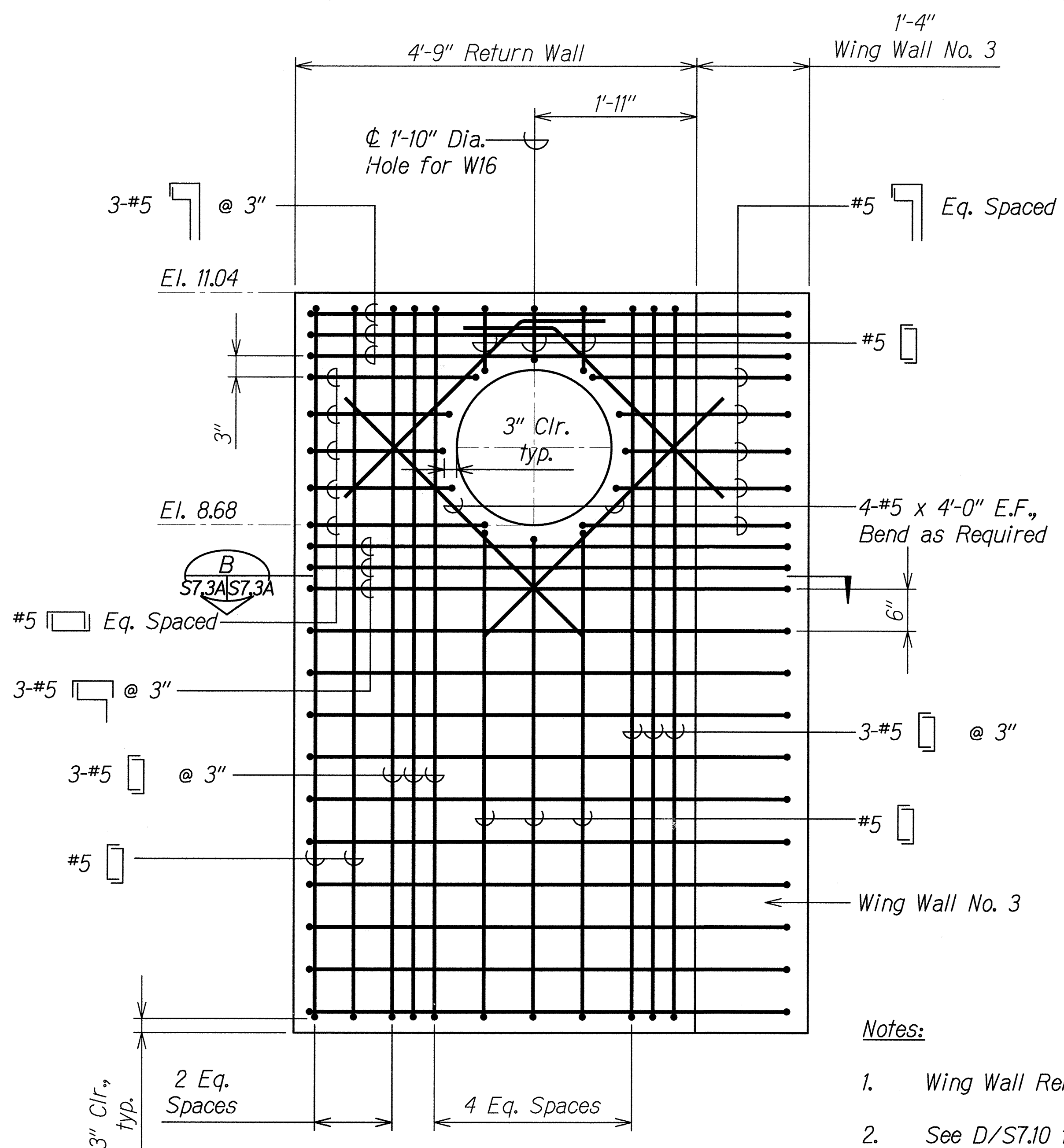
APPROVED:  DATE: MAY 24 2021
 Manager and Chief Engineer, BWS
 (for work affecting BWS facilities
 State R/W & BWS easements only)




 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

 SIGNATURE DATE: 4/30/22
 MITSUNAGA & ASSOCIATES, INC. LIC. EXPIRES

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
WING WALL NO. 3
ELEVATION
 KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)
 Scale: As Noted Date: February 2021
 SHEET No. S7.3 OF 11 SHEETS

| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-----------------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 114 | 161 |



SECTION
Scale: 1" = 1'-0"
B
S7.3A | S7.3A

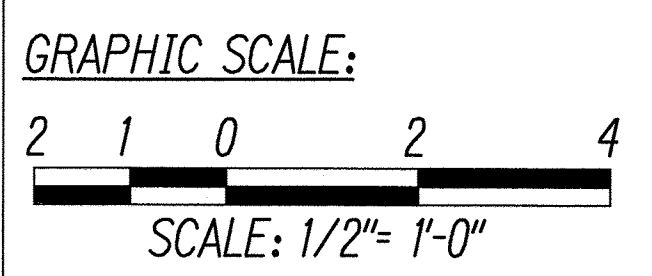
- Notes:**
1. Wing Wall Reinforcement not shown for Clarity.
 2. See D/S7.10 for Additional Information at 1'-10" Diameter Hole.

RETURN WALL SECTION
Scale: 1" = 1'-0"
A
S7.3 | S7.3A

| | |
|-------------------|------|
| ORIGINAL PLAN | DATE |
| SURVEY PLOTTED BY | |
| DRAWN BY | |
| DESIGNED BY | |
| QUANTITIES BY | |
| CHECKED BY | |
| No. | |

DRAWING NAME: T:\PROJECTS\1-ACME FILES\A13-01_KAPAPAAU BRIDGE\\$\$ REVISED STRUCT\\$.05121\X59-5701.DWG PLOT TIME: 05-20-21 11:31 AM

APPROVED:
[Signature]
Manager and Chief Engineer, BWS
(for work affecting BWS facilities
State R/W & BWS easements only)
MAY 24 2021
DATE



DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.
THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION
[Signature]
4/30/22
SIGNATURE MITSUNAGA & ASSOCIATES, INC.

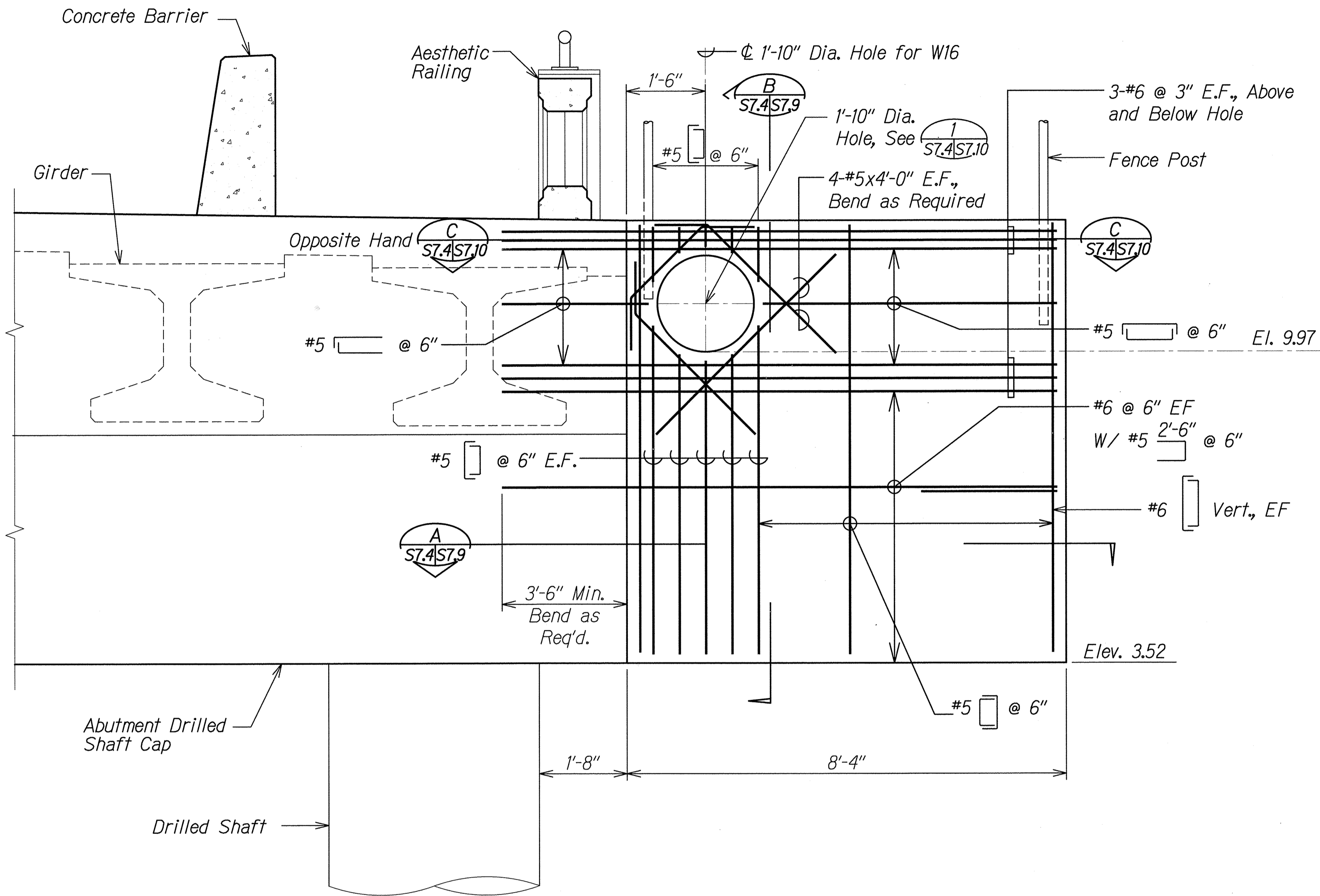
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RETURN WALL SECTIONS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021
SHEET No. S7.3A OF 11 SHEETS

| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
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| HAWAII | HAW. | BR-083-1(48) | 2021 | 115 | 161 |



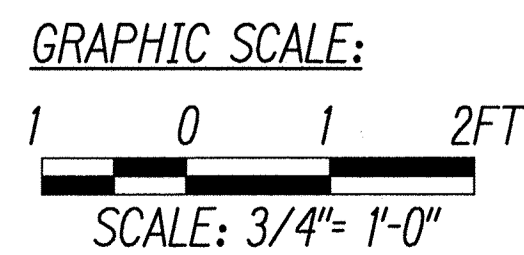
WING WALL NO. 4 ELEVATION
 Scale: 3/4" = 1'-0"
 A
 S6.2 | S7.4

| | |
|-------------------|------|
| SURVEY PLOTTED BY | DATE |
| DRAWN BY | |
| TRACED BY | |
| DESIGNED BY | |
| QUANTITIES BY | |
| CHECKED BY | |
| ORIGINAL PLAN | |
| NOTE BOOK | |
| No. | |

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\013-01_KAIPAPAU BRIDGE\115 REVISED STRUCT\115-051221\115-S7.4.DWG PLOT TIME: 05-20-21 11:37 AM

APPROVED:

 Manager and Chief Engineer, BWS
 (for work affecting BWS facilities
 State R/W & BWS easements only)
 MAY 24 2021
 DATE



THIS WORK WAS PREPARED BY
 ME OR UNDER MY SUPERVISION

 LIC. EXPIRATION 4/30/22
 SIGNATURE LIC. EXPIRATION
 MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

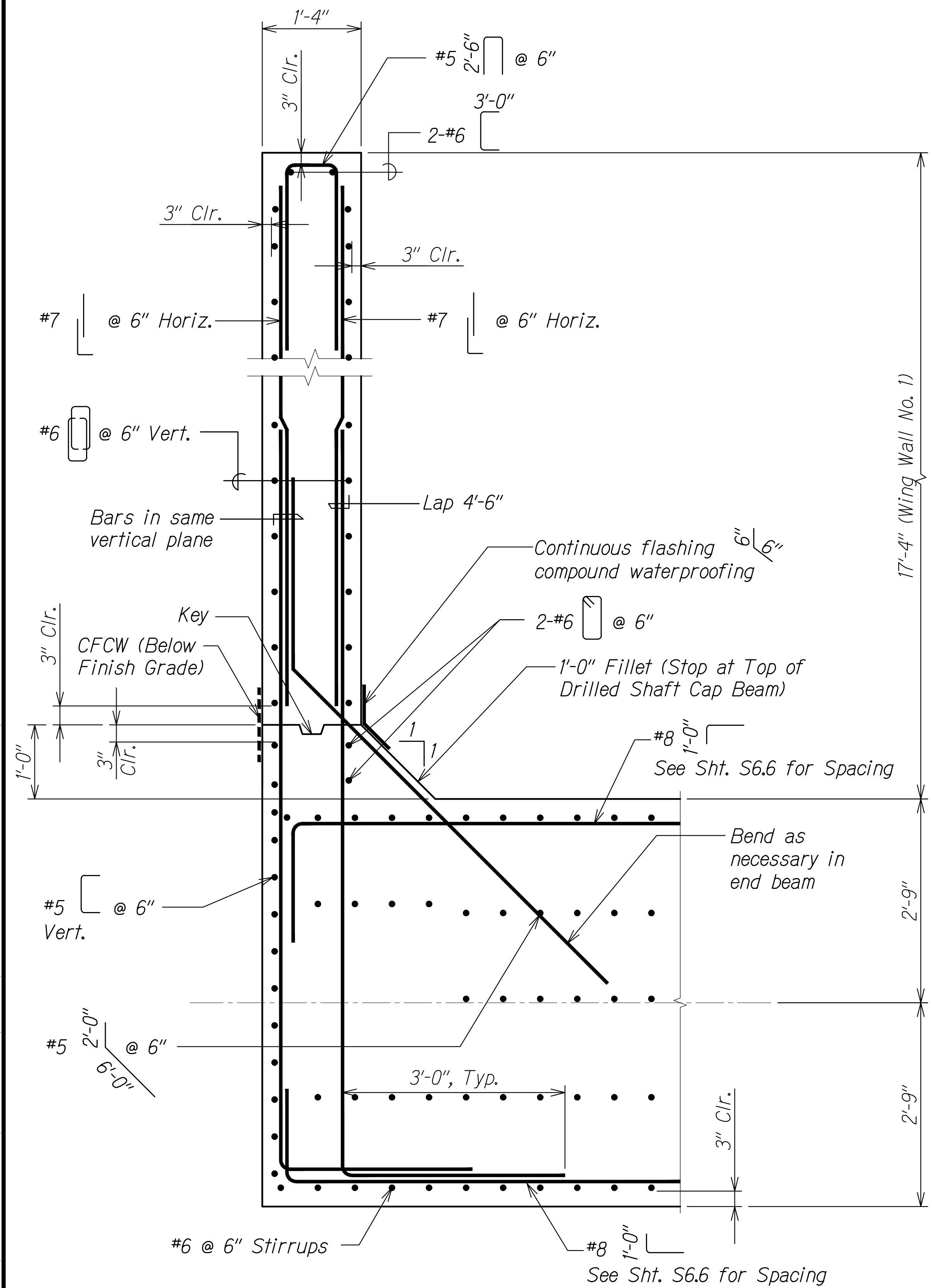
WING WALL NO. 4 ELEVATION

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

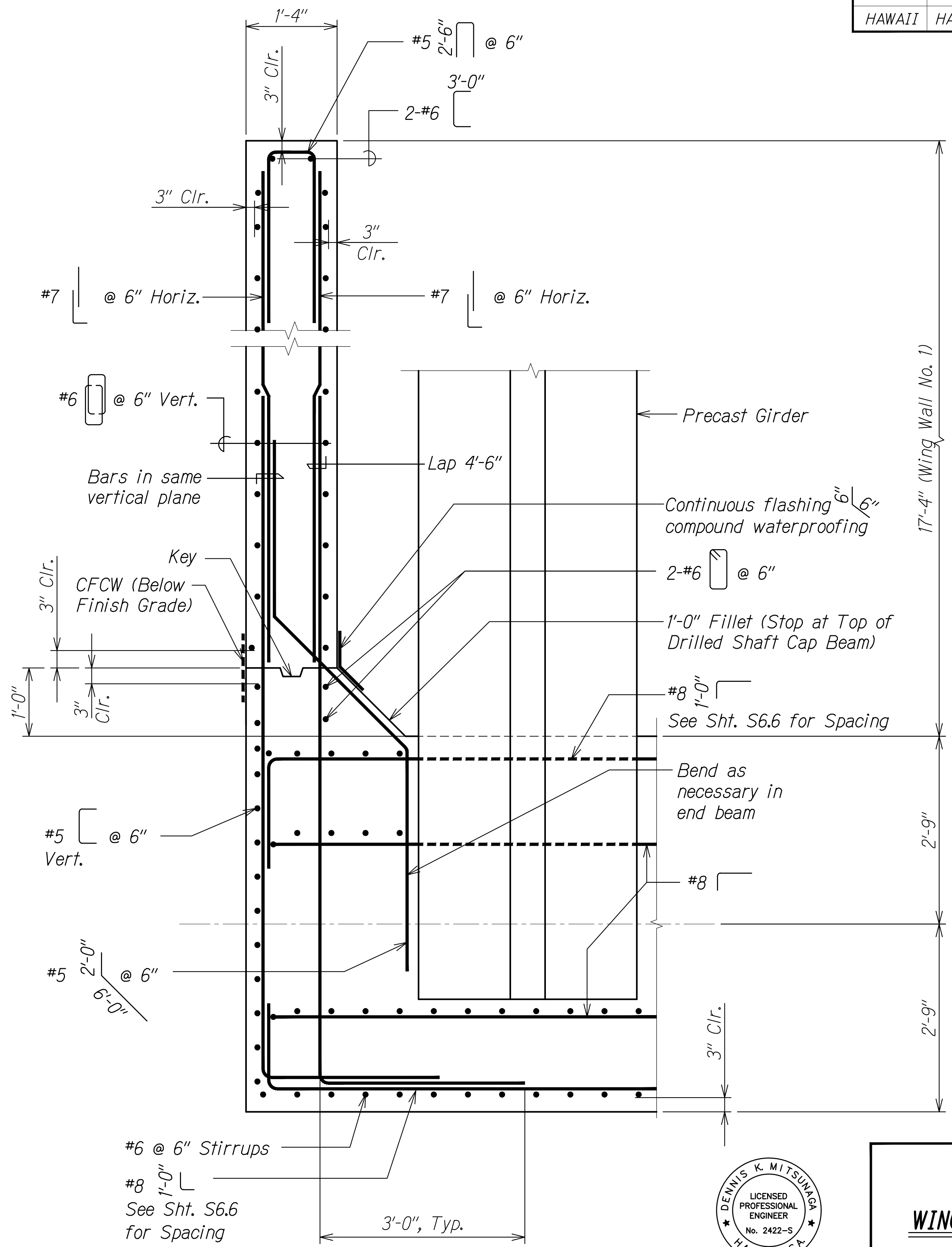
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SHEET No. S7.4 OF 11 SHEETS

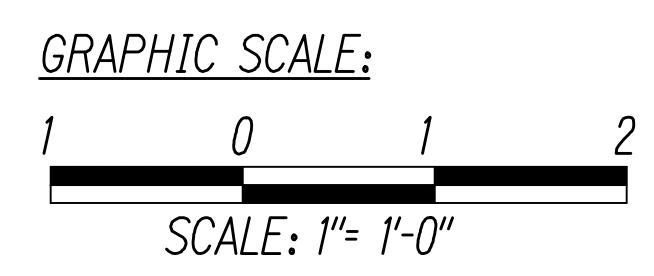
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|---------------------|-------|-----------------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 116 | 161 |



SECTION A
Scale: 1" = 1'-0" **S7J S7.5**



SECTION B
Scale: 1" = 1'-0" **S7J S7.5**



| | |
|---------------|------|
| ORIGINAL PLAN | DATE |
| DESIGNED BY | BY |
| CHECKED BY | DATE |
| QUANTITIES BY | |
| NO. | |

DRAWING NAME: I:\PROJECTS\ACTIVE FILES\13-01_KAIPAPAU BRIDGE\REVISED_STRUCTURE\13-01_KAIPAPAU BRIDGE_S7.5.DWG PLOT TIME: 06-09-21 3:29 PM

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.

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4/30/22
SIGNATURE LIC. EXPIRATION
MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

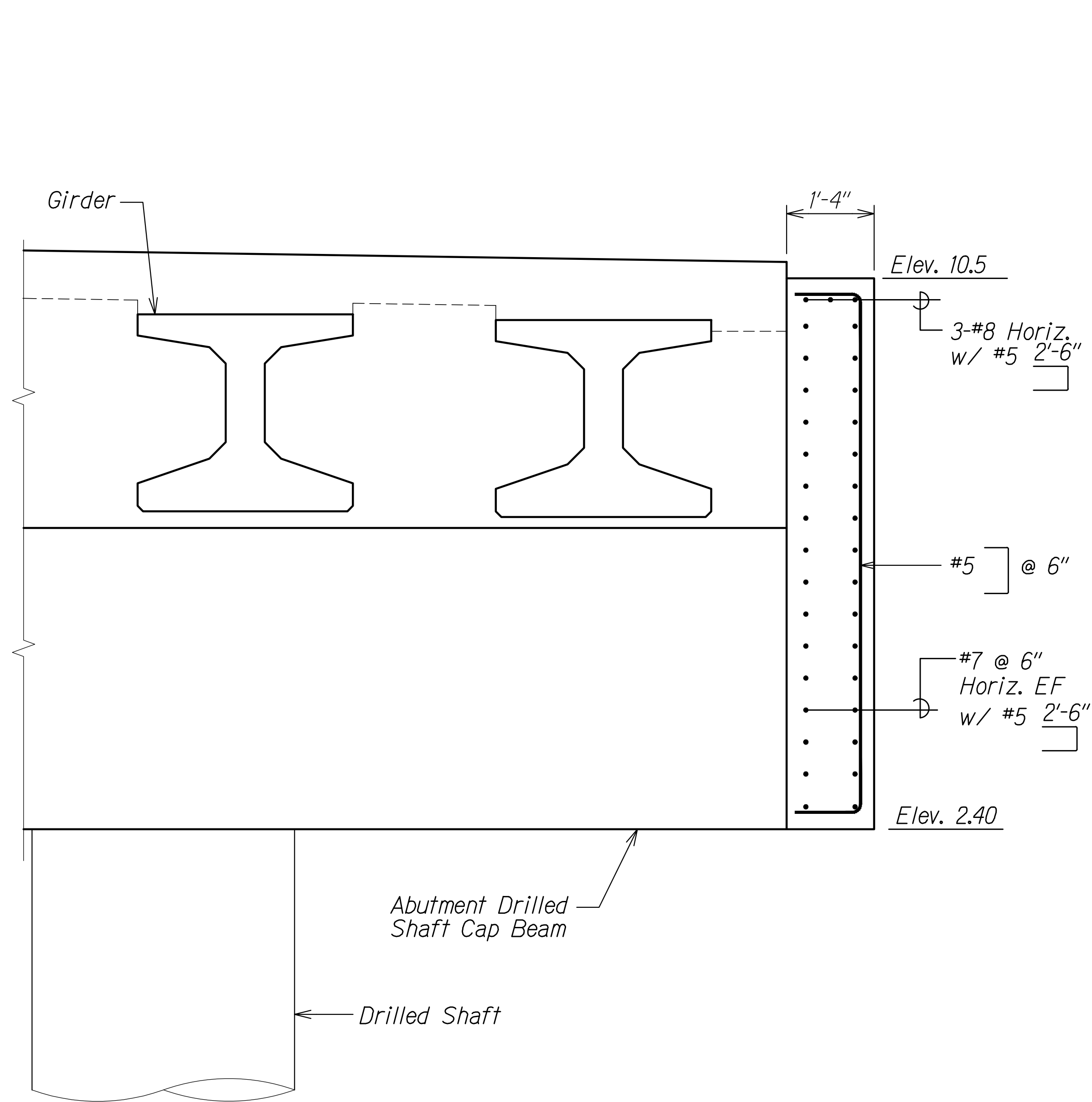
WING WALL NO. 1 SECTIONS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

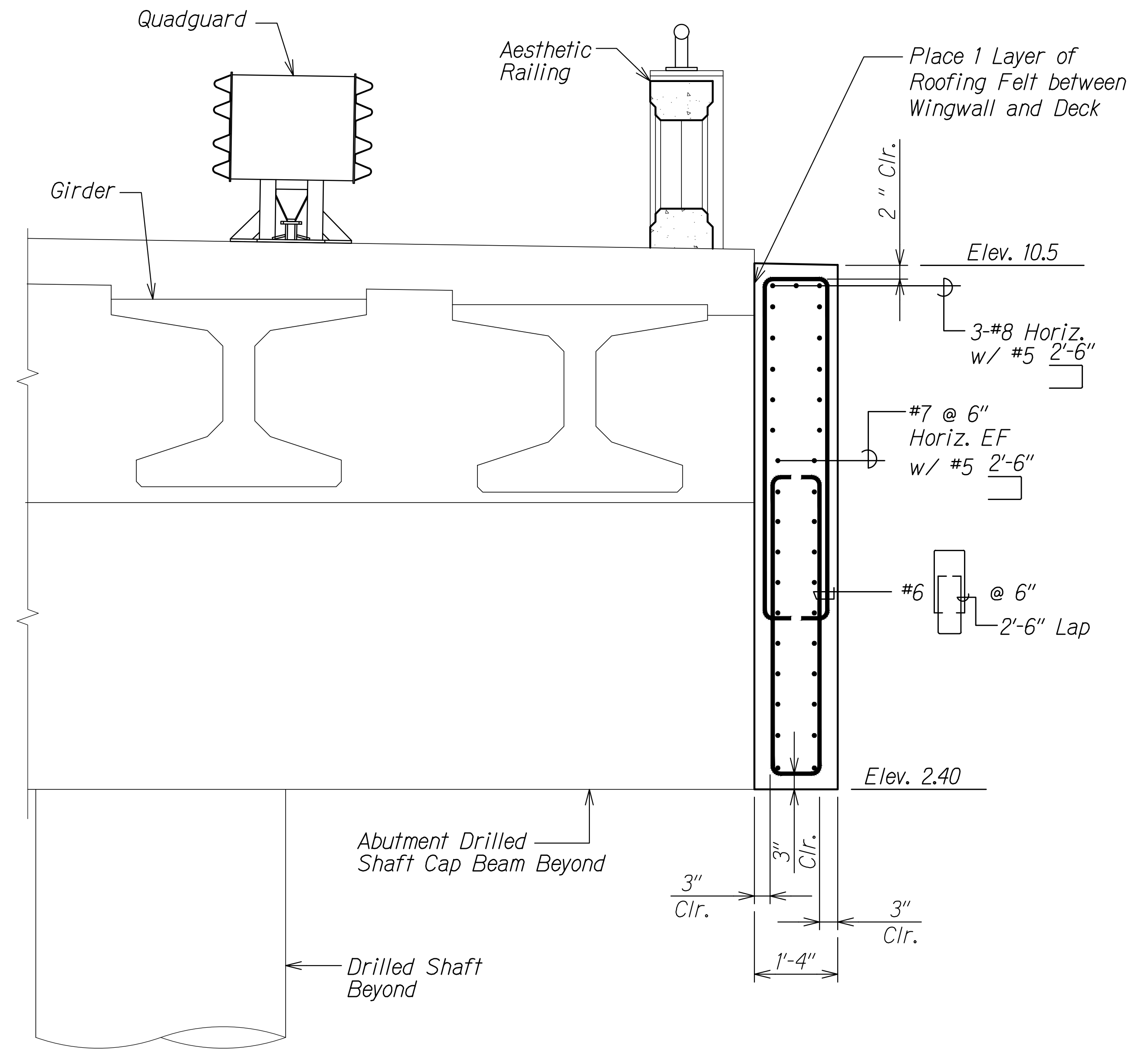
Scale: As Noted Date: February 2021

SHEET No. S7.5 OF 11 SHEETS

| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
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| HAWAII | HAW. | BR-083-1(48) | 2021 | 117 | 161 |



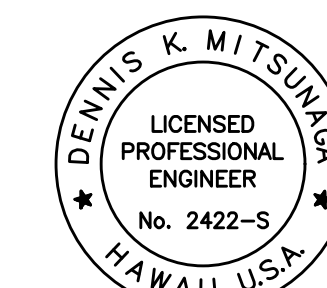
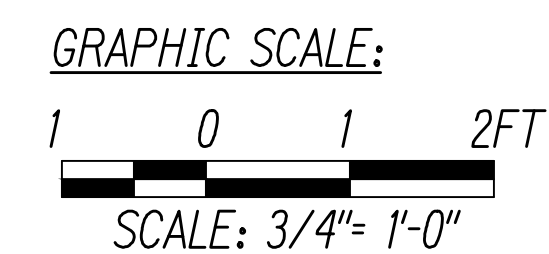
WING WALL NO. 1 SECTION A
 Scale: 3/4" = 1'-0"
 STJ | S7.6



WING WALL NO. 1 SECTION B
 Scale: 3/4" = 1'-0"
 STJ | S7.6

| | |
|---------------|------|
| ORIGINAL PLAN | DATE |
| DESIGNED BY | |
| CHECKED BY | |
| NO. _____ | |

DRAWING NAME: T:\PROJECTS\ACTIVE FILES\13-01-KAIPAPAU BRIDGE\REVISED_STRUCTURE\051221\KSB-S701.DWG PLOT TIME: 06-09-21, 3:29 PM



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 SIGNATURE: *[Signature]* LIC. EXPIRATION: 4/30/22
 MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

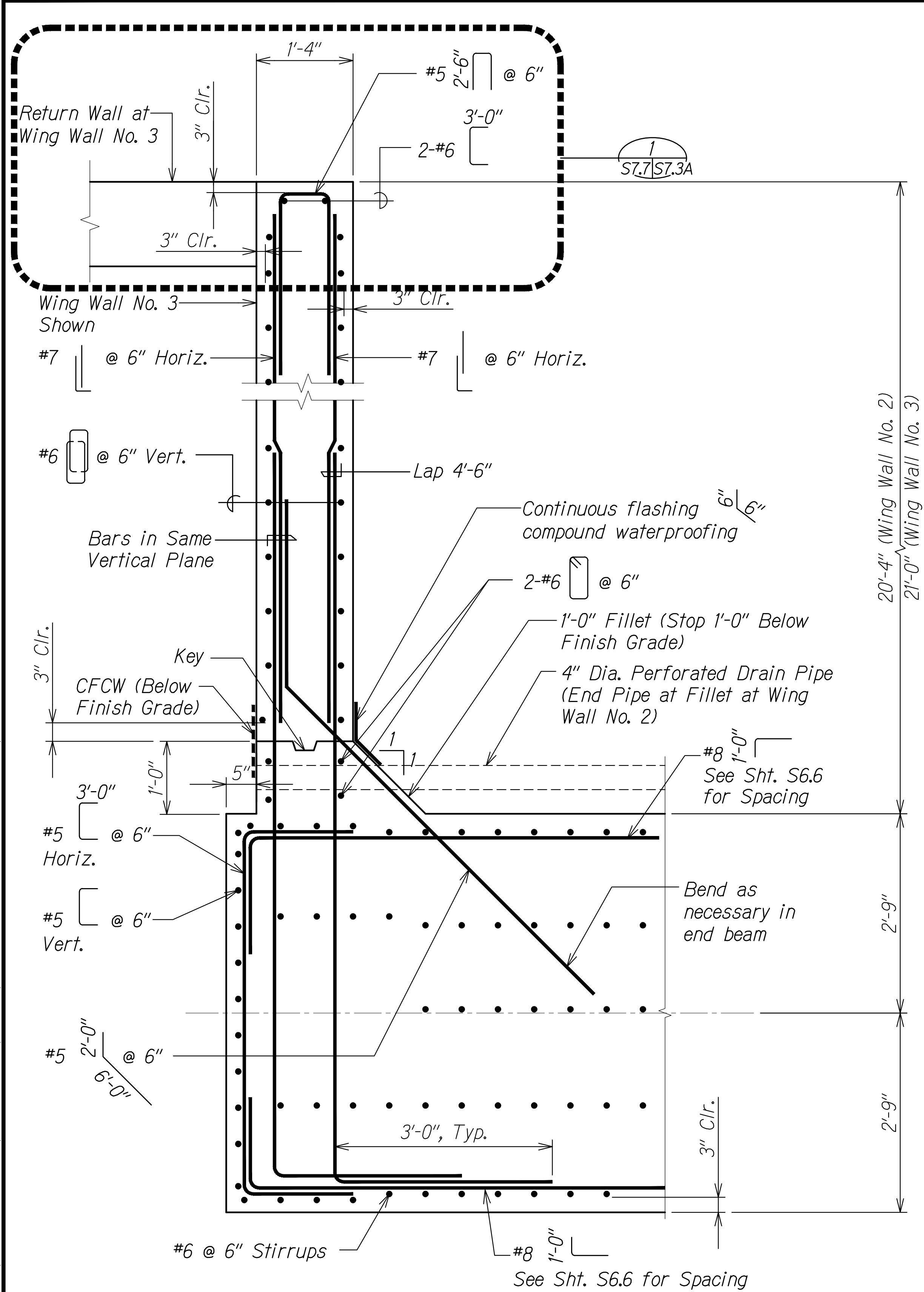
WING WALL NO. 1 SECTIONS

KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)

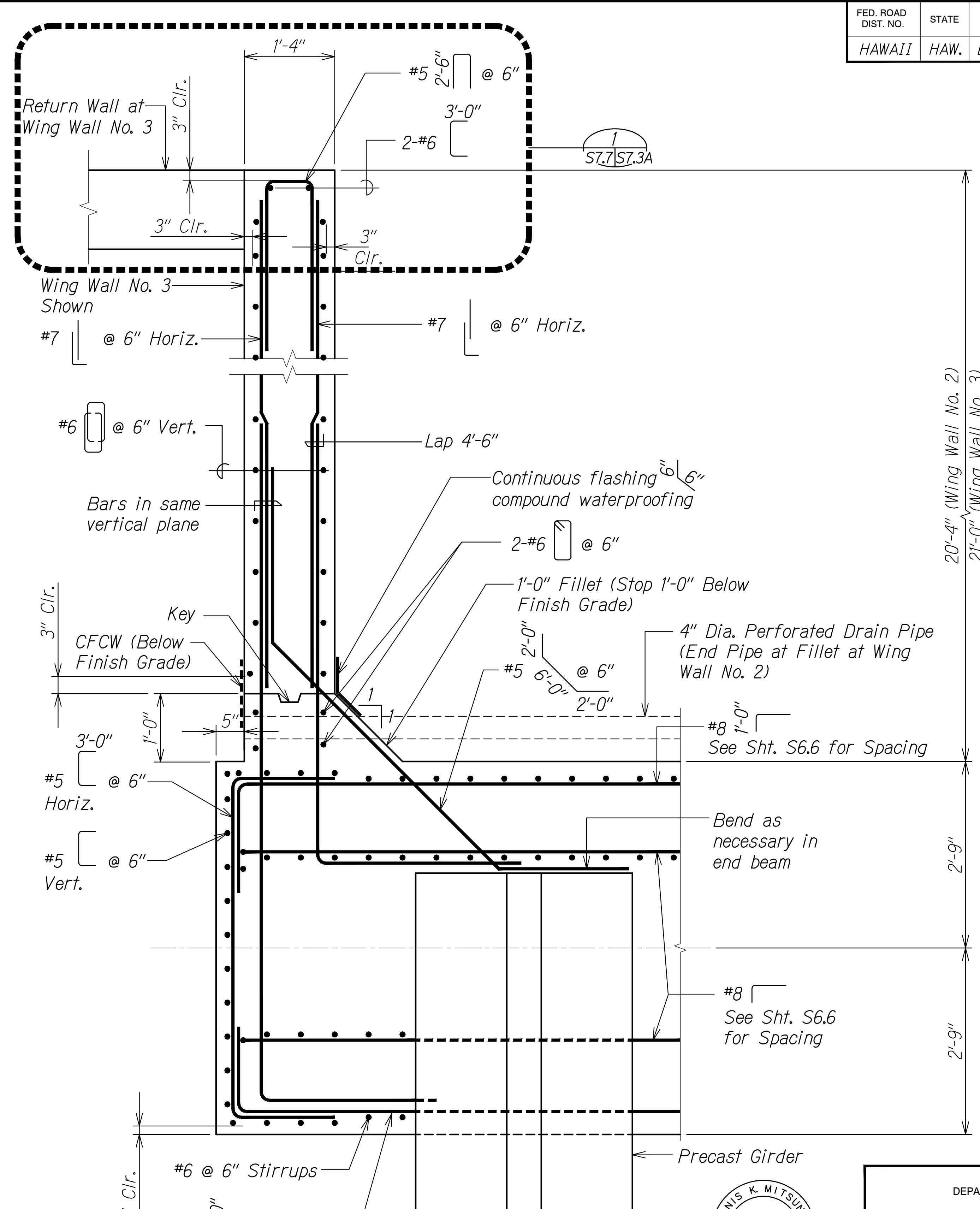
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SHEET No. S7.6 OF 11 SHEETS

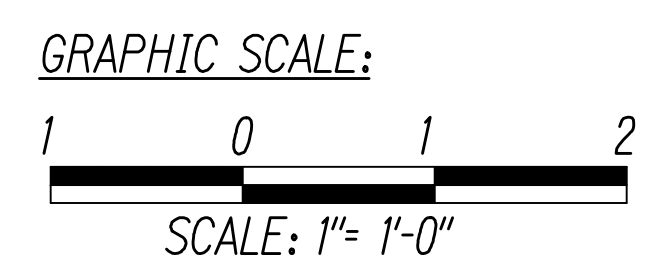
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| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 118 | 161 |



SECTION A
Scale: 1" = 1'-0"
S7.2 | S7.7
S7.3



SECTION B
Scale: 1" = 1'-0"
S7.2 | S7.7
S7.3



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| ORIGINAL PLAN | DATE |
| DESIGNED BY | |
| CHECKED BY | |
| NO. | |

DRAWING NAME: I:\PROJECTS\ACTIVE FILES\13-01_KAIPAPAU BRIDGE\REVISED_STRUCTURE\051221\KSB-S701.DWG PLOT TIME: 09-09-21, 3:30 PM

DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.
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4/30/22
SIGNATURE LIC. EXPIRATION
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

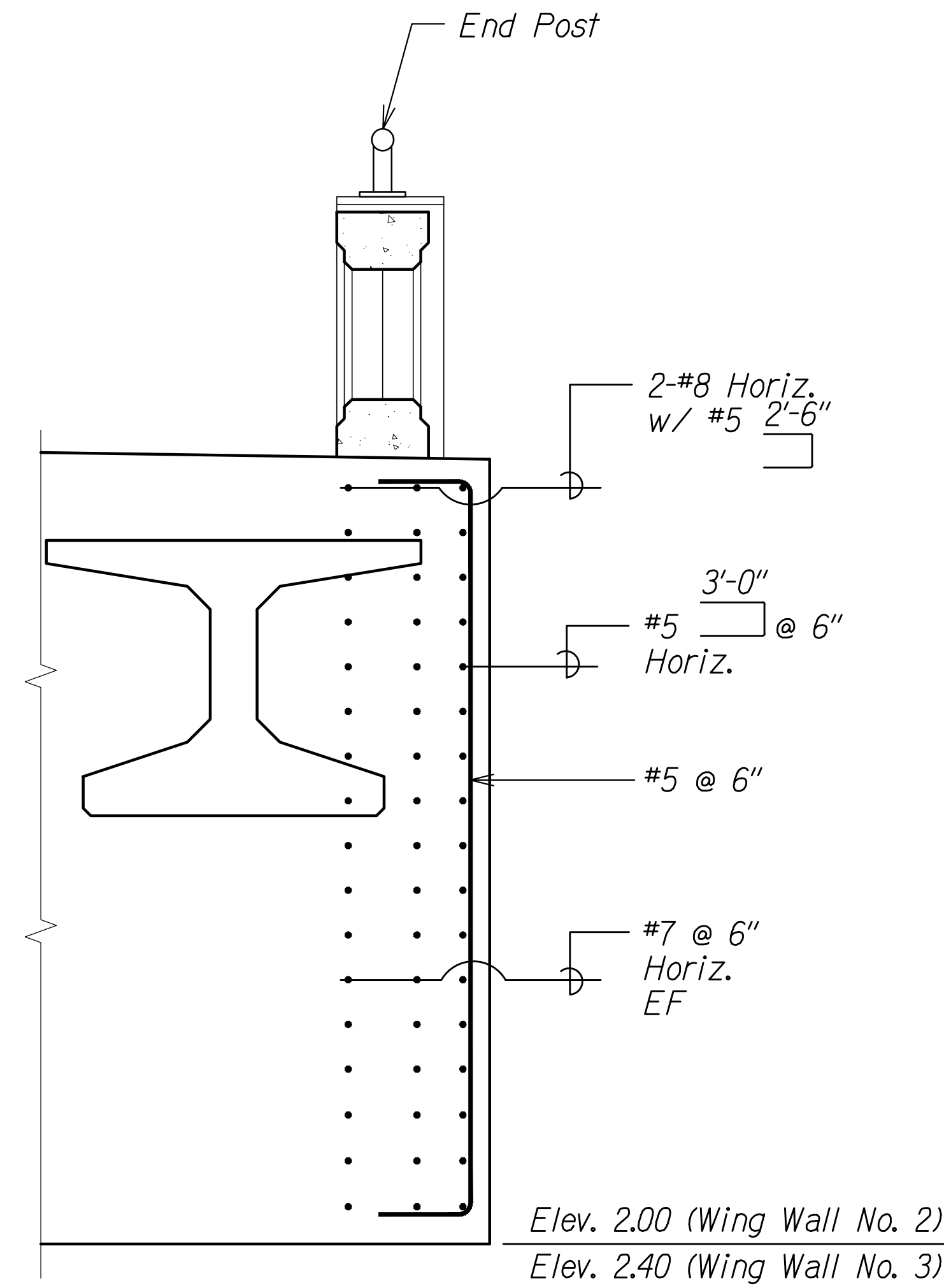
WING WALL NOS. 2 AND 3
SECTIONS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

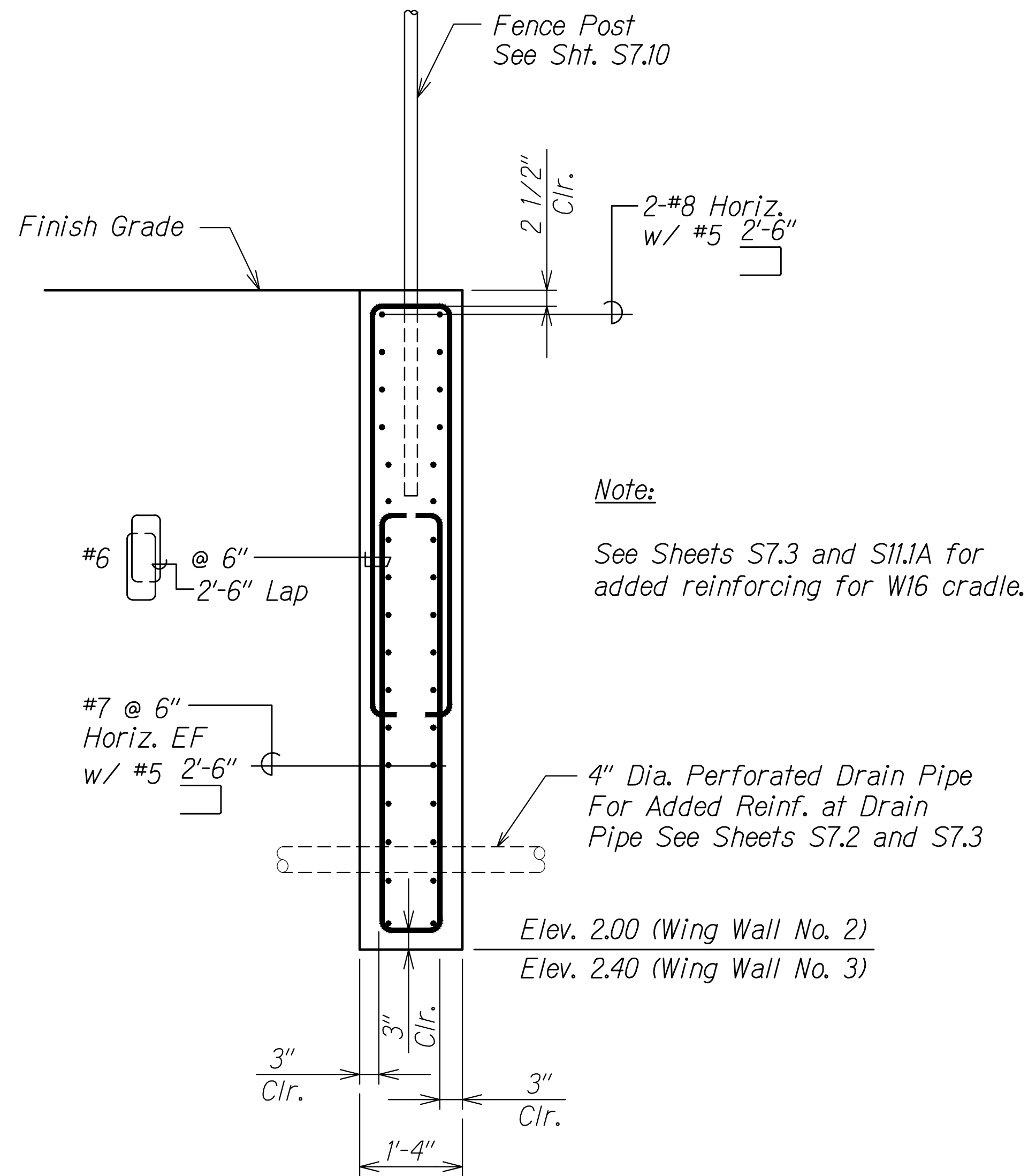
Scale: As Noted Date: February 2021

SHEET No. S7.7 OF 11 SHEETS

| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-----------------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 119 | 161 |



WING WALL SECTION A
 Scale: 3/4" = 1'-0"
 S7.2 S7.8
 S7.3



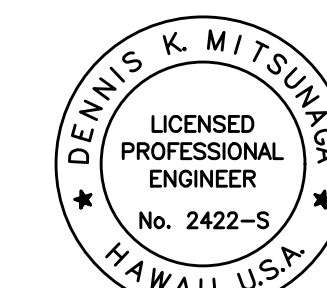
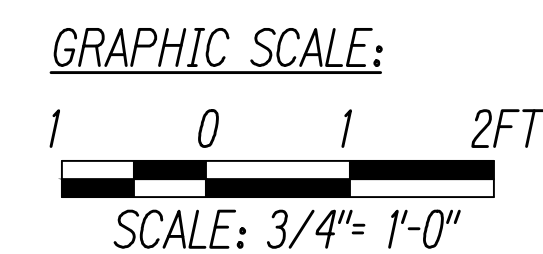
WING WALL SECTION B
 Scale: 3/4" = 1'-0"
 S7.2 S7.8
 S7.3

Note:
 See Sheets S7.3 and S11.1A for added reinforcing for W16 cradle.

4" Dia. Perforated Drain Pipe For Added Reinf. at Drain Pipe See Sheets S7.2 and S7.3

| | |
|---------------|------|
| ORIGINAL PLAN | DATE |
| DESIGNED BY | |
| CHECKED BY | |
| NO. _____ | |

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 LIC. EXPIRATION: 4/30/22
 MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

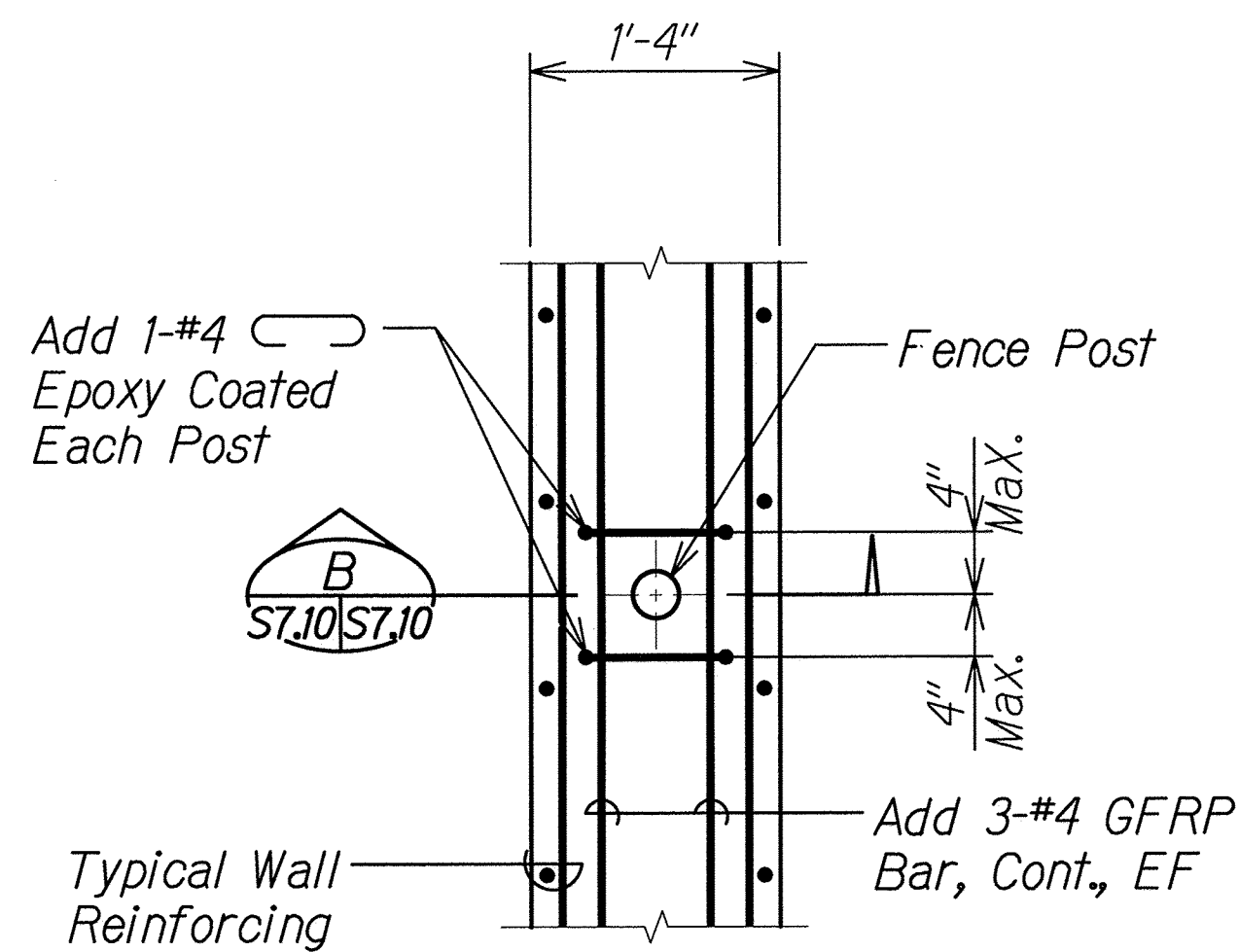
WING WALL SECTIONS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

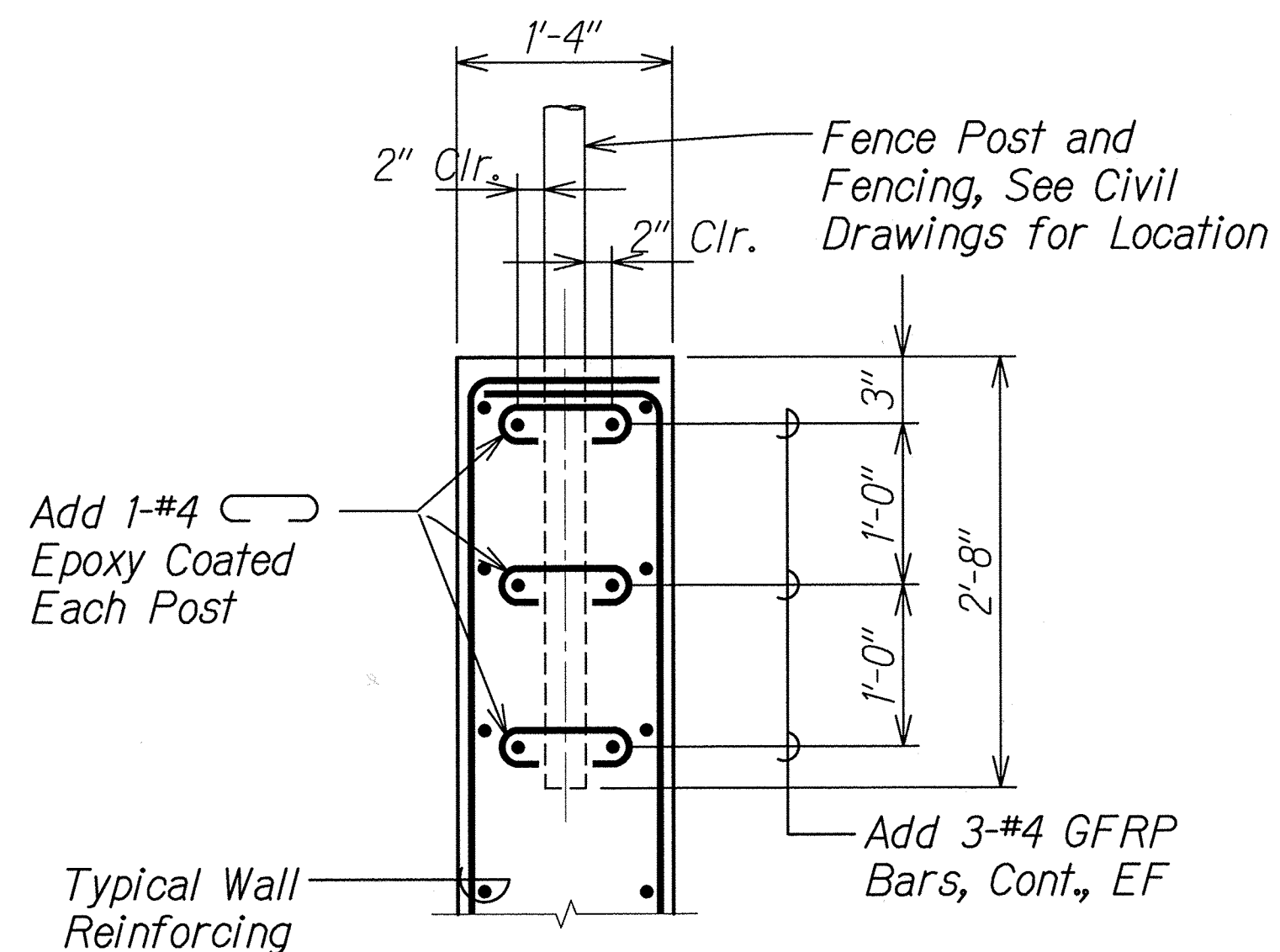
Scale: As Noted Date: February 2021

SHEET No. S7.8 OF 11 SHEETS

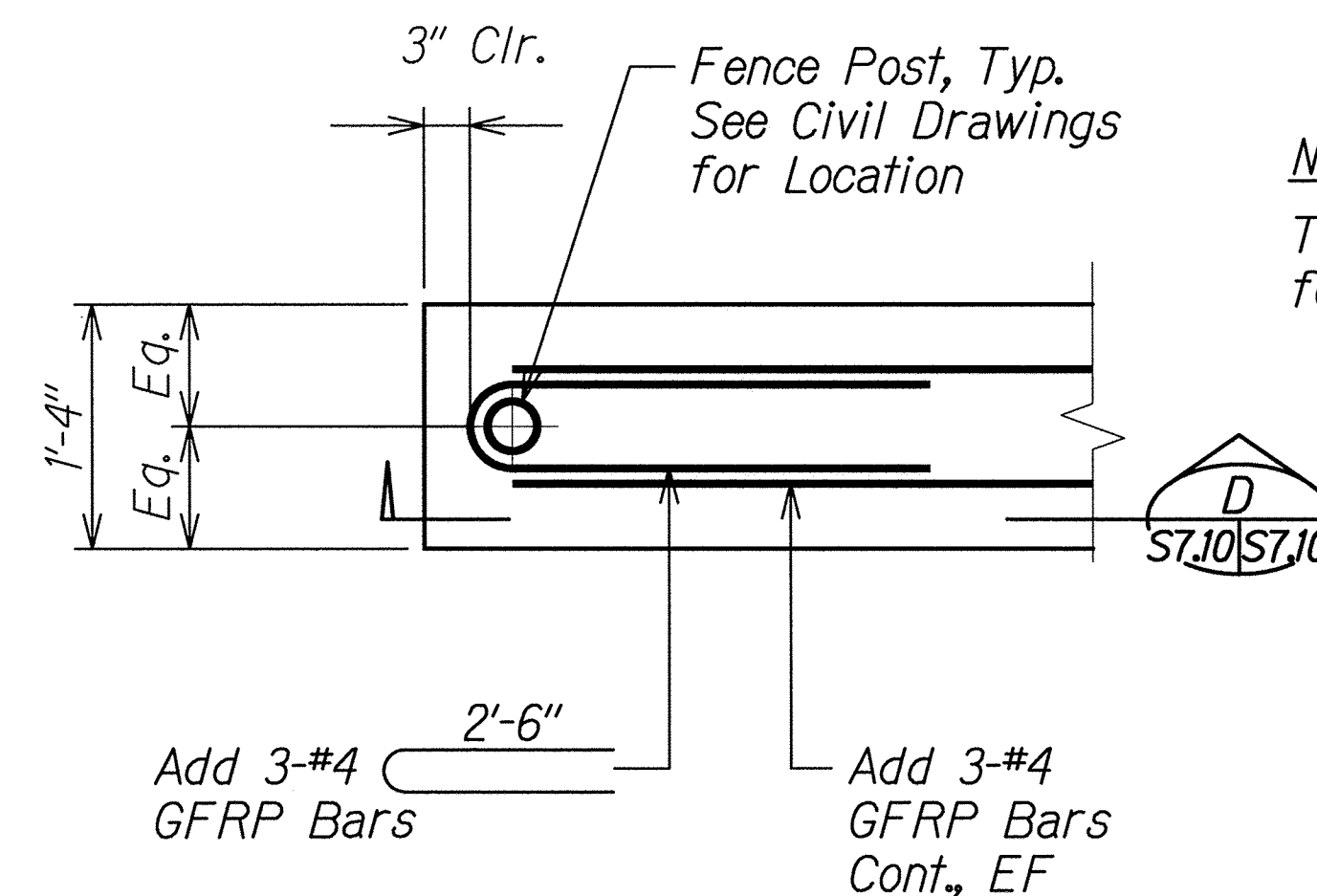
| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-----------------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 121 | 161 |



PLAN SECTION
Scale: 1" = 1'-0"
S7.3, S7.8, S7.9

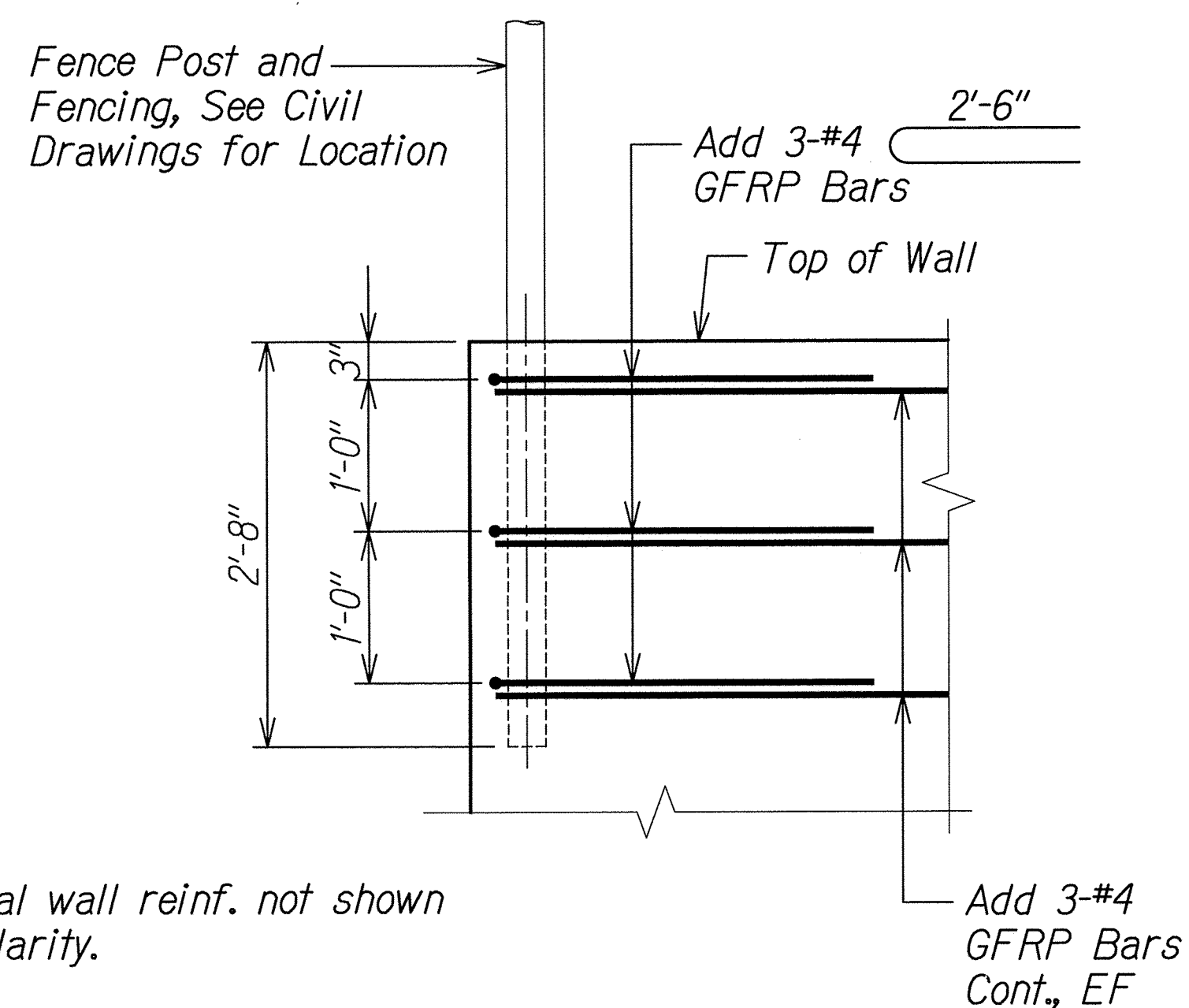


TYPICAL POST DETAIL AT RETAINING WALL
Scale: 1" = 1'-0"
S7.3, S7.8, S7.9

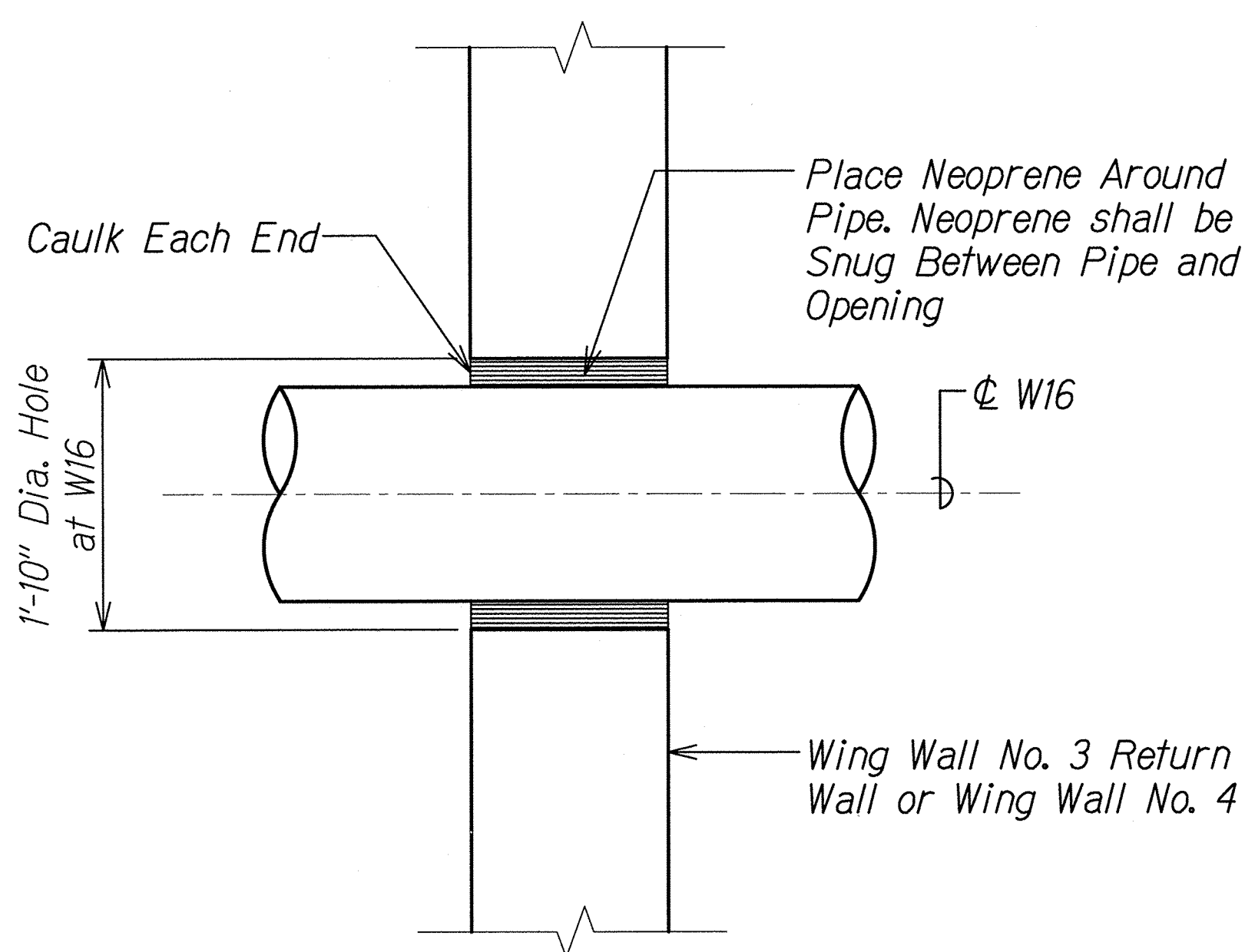


TYPICAL CHAINLINK POST AT END OF WALL - PLAN
Scale: 1" = 1'-0"
S7.3, S7.8, S7.9

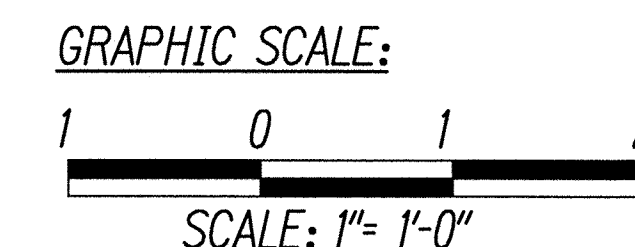
Note:
Typical wall reinf. not shown for clarity.



TYPICAL CHAINLINK POST AT END OF WALL - ELEVATION
Scale: 1" = 1'-0"
S7.3, S7.8, S7.9



W16 OR W8 AT WING WALLS
Scale: 1" = 1'-0"
S7.3, S7.3A, S7.4, S7.10



| | |
|---------------|------|
| ORIGINAL PLAN | DATE |
| DRAWN BY | |
| TRACED BY | |
| DESIGNED BY | |
| QUANTITIES BY | |
| CHECKED BY | |
| No. | |

DRAWING NAME: PROJECT: ACTIVE: FILE: 01-01-KAIPAPAU BRIDGE; REVISED: STRUCTS: 051221W-CB-S710.DWG; PLOT TIME: 05-13-21, 8:43 AM

APPROVED:
MAY 24 2021
DATE
Manager and Chief Engineer, BWS
(for work affecting BWS facilities
State R/W & BWS easements only)

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
SIGNATURE: Mitsunaga & Associates, Inc. LIC. EXPIRATION: 4/30/22

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL DETAILS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. S7.10 OF 11 SHEETS

| | | | | | |
|---------------------|-------|-----------------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 122 | 161 |

DRILLED SHAFT NOTES:

1. All excavation and drilling operations for foundations shall be monitored by the Engineer.
2. Bottom of drilled shaft cap beam and drilled shaft tip elevations shall be verified by the Engineer prior to placing reinforcement and concrete.
3. Concrete shall be placed in the shaft immediately after placing the reinforcing steel and shall not be placed without approval of the Engineer.
4. Drilled shaft tip elevations shown on this sheet are the minimum depths to be constructed and shall be used to estimate quantities for bidding. The actual tip elevation shall be determined by the Engineer.
5. Construction of drilled shafts shall be done in such a manner and sequence to prevent collapse of drilled shafts due to premature loading of poured drilled shafts before its 28-day concrete strength and other mishaps that may reduce its capacity.
6. Drilling of adjacent shafts shall be staggered in such a manner that the shaft concrete shall have cured a minimum of 24 hours prior to drilling adjacent shafts.
7. Reinforcement:
 - A. Lap splice length for #10 Cont. shall be 6'-6". No lap splices are allowed in the upper half of the drilled shaft.
 - B. Lap splice length for #6 Spiral shall be 3'-8".
 - C. Stagger splice points so that not more than 50% of the bars are spliced at any section normal to axis of the member.
 - D. Lapped splices shall have a minimum of 2'-0" vertically between ends of splice points.
8. Concrete for drilled shaft shall have a compressive strength of 4500 psi at 28-days of age.
9. Unless noted otherwise, concrete for drilled shafts shall be placed by pumping through a solid tremie pipe. A water reducing and set retarding admixture may be used in all drilled shaft concrete. Proposed admixture shall be tested and certified in the mix design and approved by the Engineer.
10. Concrete placement shall continue after the shaft is full and until good quality concrete is evident at the least 4 feet above top of the shaft and/or drilled shaft extension.
11. Vibration or agitation of drilled shaft concrete during placement is prohibited.
12. Plastic spacers or spacers made with accepted materials shall be used to maintain proper position and clearances to reinforcing bars.
13. The Contractor shall record actual volume of drilled shaft concrete placed and compare with predicted and/or theoretical volumes.
14. The center of the drilled shaft concrete and reinforcing bars shall not vary horizontally by more than 3 inches from the location shown on the plans. The vertical alignment of the drilled shaft shall not vary by more than quarter (1/4) inch per foot of depth.
15. An instrumented load test shall be conducted on the drilled shaft load test shaft. The drilled shaft load test shaft shall be located in the vicinity of Abutment No. 2, as shown on sheet S1.1 and S1.2 and shall be a minimum length of 109 feet below the ground surface. The drilled shaft load test shaft shall be reinforced as shown. A bi-directional axial load test shall be conducted using an expandable base load cell (Osterberg load cell).
The drilled shaft load test should be performed in general accordance with the quick load test method of ASTM Test Designation D 1143 except as modified in specifications. The drilled test shaft shall be loaded to failure to evaluate the ultimate side shear resistance of the shaft.
16. The drilled shaft load test shaft shall be instrumented with a minimum of forty-two (42) embedment strain gages as shown on sheet S8.3. A load cell capable of applying a test load of at least 3,600 kips in each direction shall be used. The instrumented load test shall be completed before construction of any production drilled shafts. The Contractor shall allow seven (7) working days after completion of the load test before any estimated drilled shaft tip elevations will be provided for production drilled shafts.
17. Crosshole Sonic Logging (CSL) nondestructive integrity testing shall be performed on every production shaft, trial shaft, and at the load test shaft shown on S1.1 and S1.2 and on sheets S8.2 and S8.3. Shafts indicating irregular CSL readings may be subject to additional testing, and remedial repairs or drilled shaft replacement.
18. After completion of the CSL tests and final acceptance of the drilled shaft, remove portion of CSL test access tubes within footing and completely fill tubes with non-metallic, non-shrink, non-gaseous cementitious grout of equal strength as the drilled shaft prior to footing reinforcing and concrete placement. See Specifications Section 511.

DRILLED SHAFT TABLE

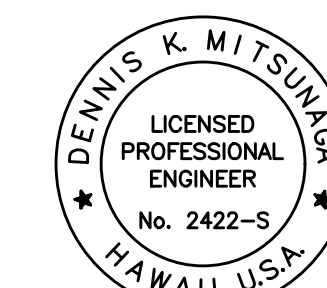
| Location | Drilled Shaft Type (in Inches) | Length (in Feet) | Estimated Tip Elevation (in Feet MSL) |
|----------------|--------------------------------|------------------|---------------------------------------|
| Abutment No. 1 | 48 | 82 | (-) 79.6 |
| Abutment No. 2 | 48 | 68 | (-) 64.5 |
| Trial Shaft | 48 | 100 | -- |

AXIAL LOADS OF DRILLED SHAFT

| Location | | Strength Limit State (Kips) | | Extreme Limit State (Kips) | |
|----------------|-------------------|-----------------------------|----------|----------------------------|----------|
| | | Demand | Capacity | Demand | Capacity |
| Abutment No. 1 | Axial Compression | 883 | 885 | 830 | 1960 |
| Abutment No. 2 | Axial Compression | 924 | 925 | 878 | 2060 |

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| ORIGINAL PLAN | DATE |
| DESIGNED BY | |
| CHECKED BY | |
| NO. | |

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 MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

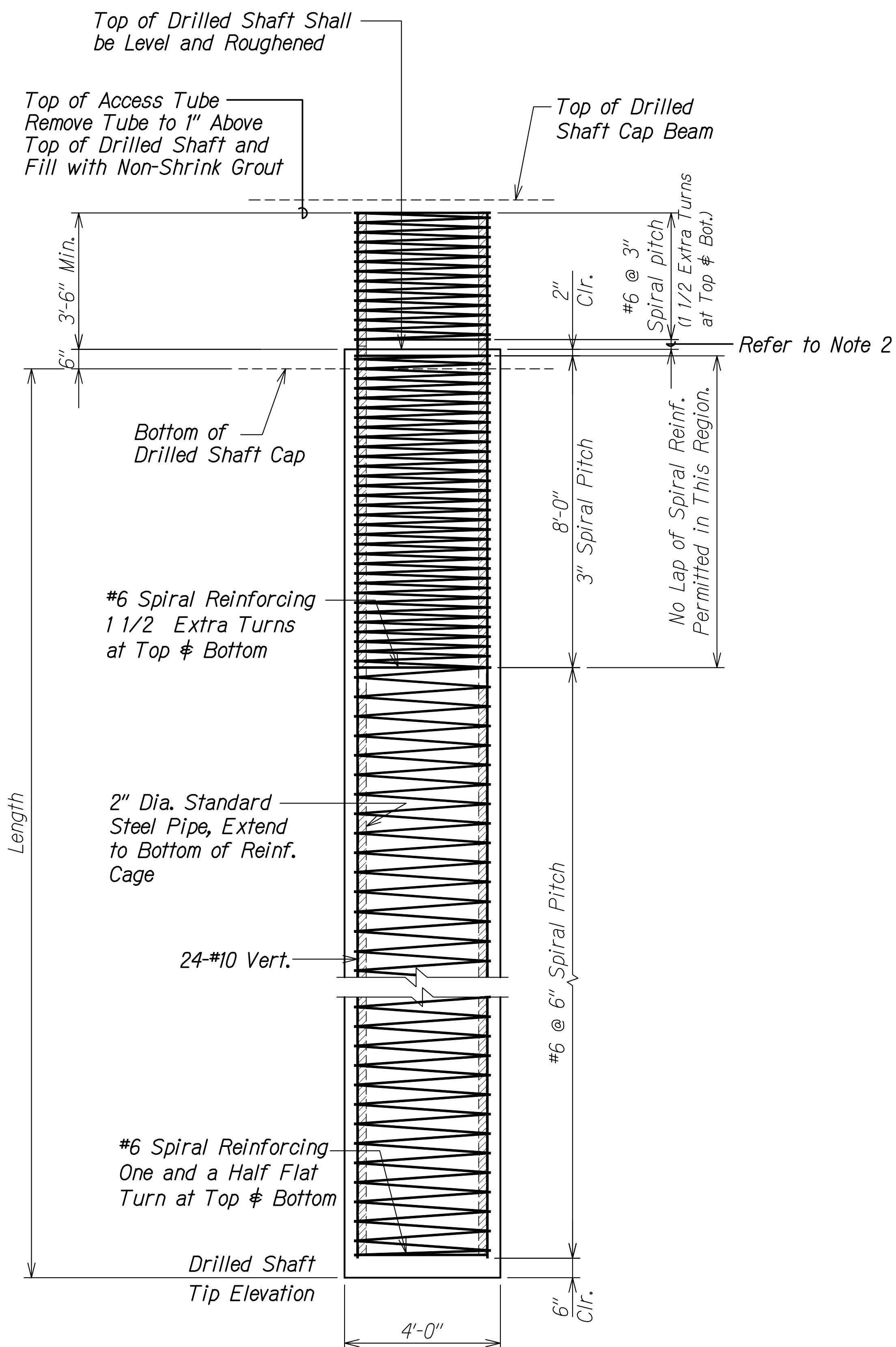
DRILLED SHAFT NOTES

**KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)**

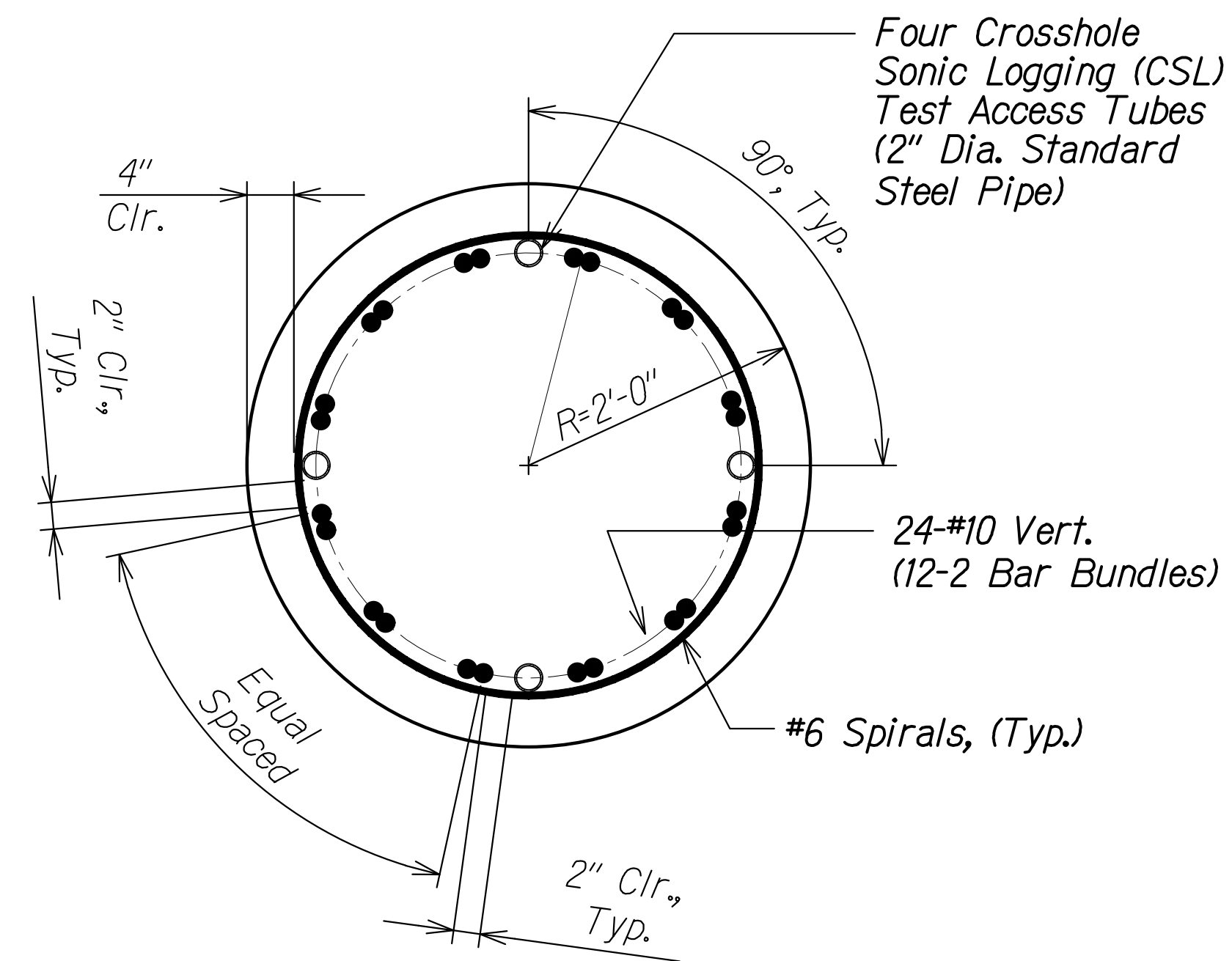
Scale: As Noted Date: February 2021

SHEET No. **S8J** OF **3** SHEETS

| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-----------------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 123 | 161 |



TYPICAL DRILLED SHAFT ELEVATION
Not to scale



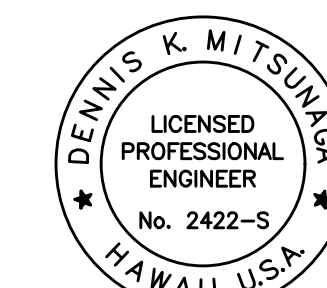
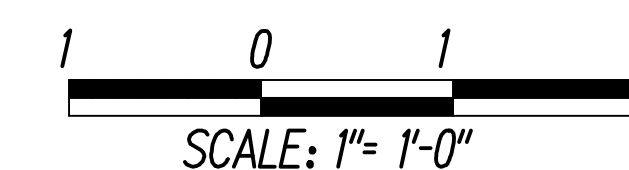
SECTION AT DRILLED SHAFT FOR ABUTMENT

Scale: 1" = 1'-0" A
S8.2/S8.2

NOTES:

1. The Contractor shall refer to the Special Provisions Section 511 "DRILLED SHAFT".
2. Spirals may be discontinuous at drilled shaft cap beam reinforcement to allow for placing drilled shaft cap beam reinforcement. Each end of the spiral shall have 1 1/2 extra turns.
3. Provide template or mock-up to ensure no interference between vertical #10 bars and horizontal rebars in shaft cap beams.

GRAPHIC SCALE:



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MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRILLED SHAFT SECTION AND ELEVATION

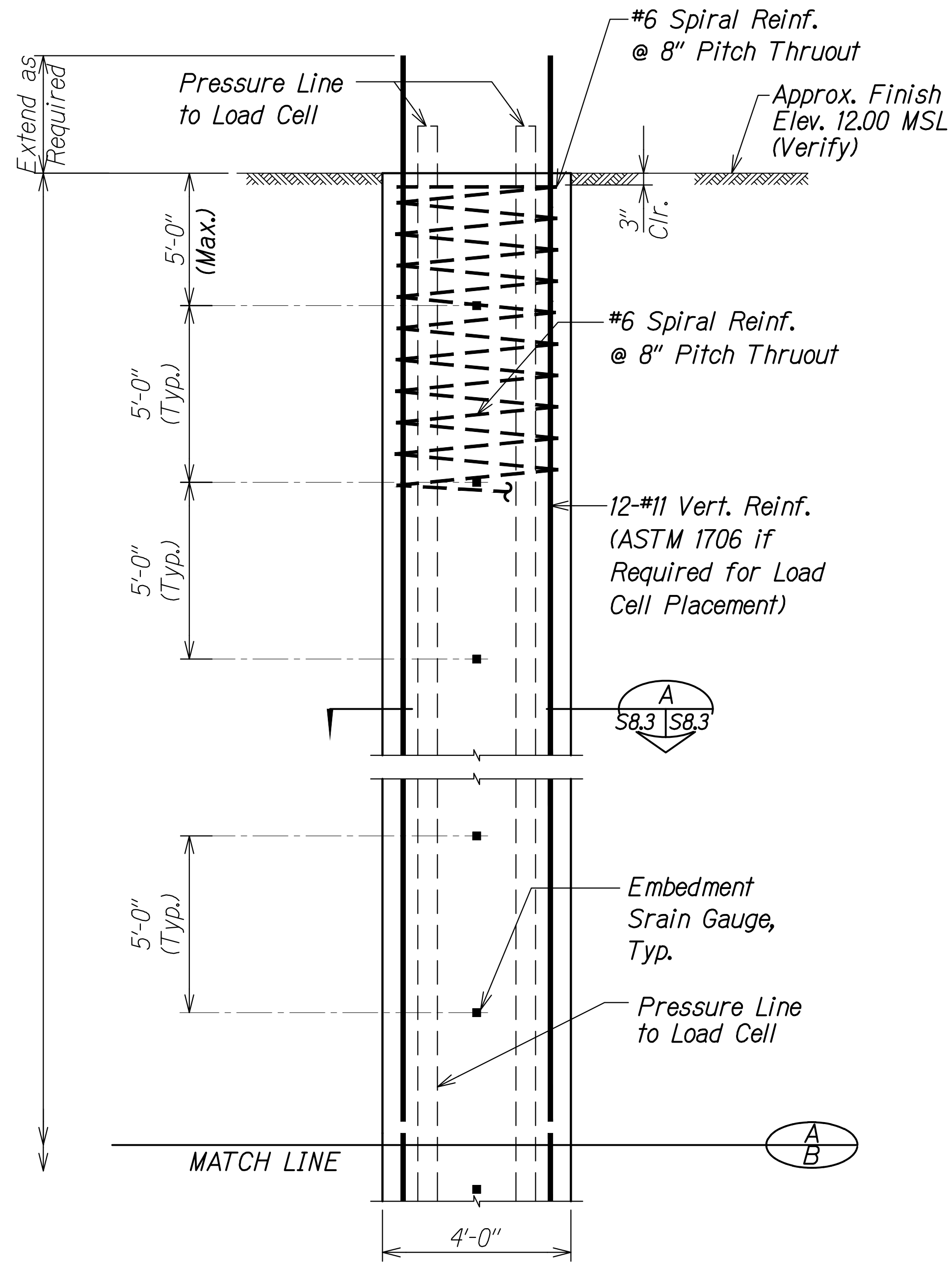
KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

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| ORIGINAL PLAN | DATE |
| DESIGNED BY | |
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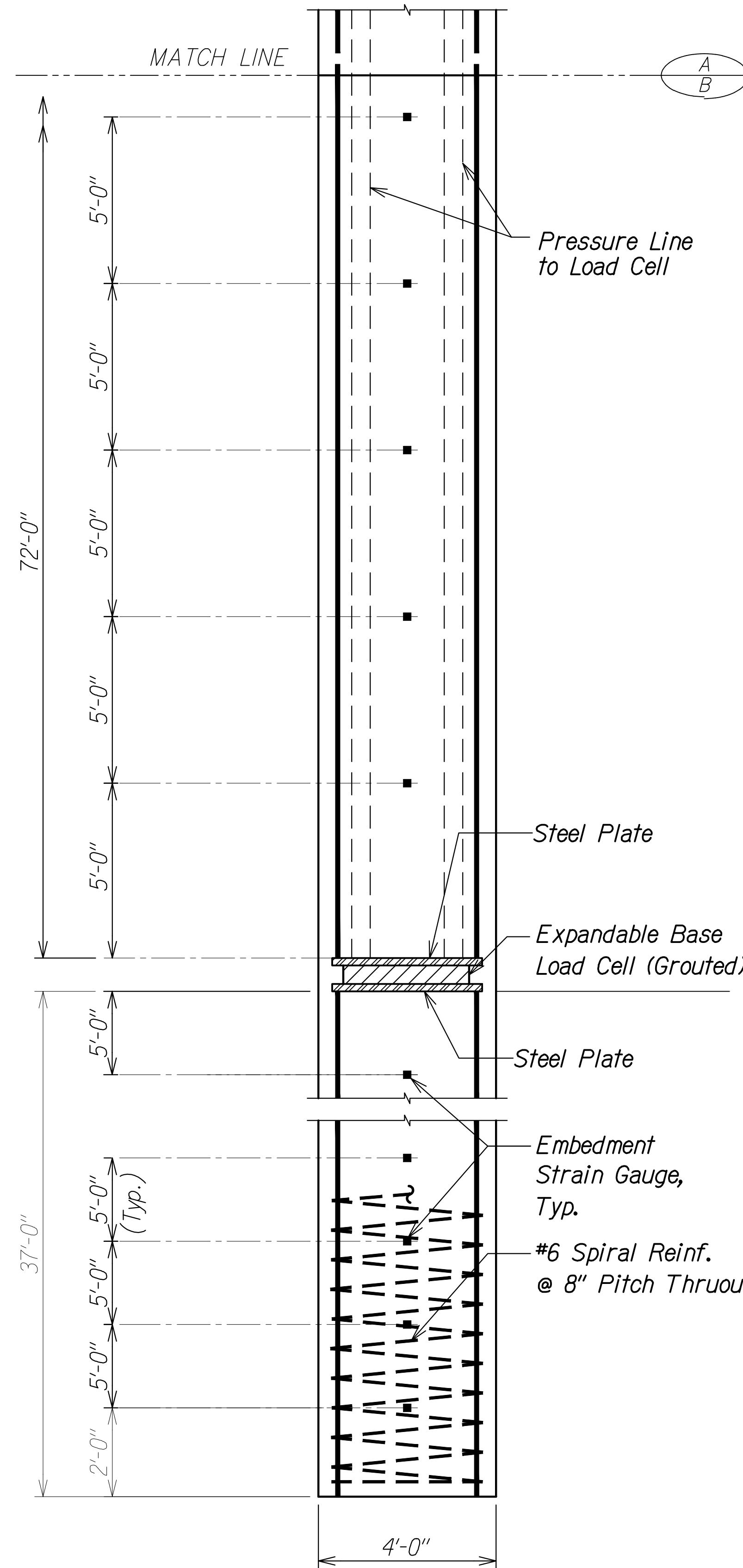
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| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
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| HAWAII | HAW. | BR-083-1(48) | 2021 | 124 | 161 |



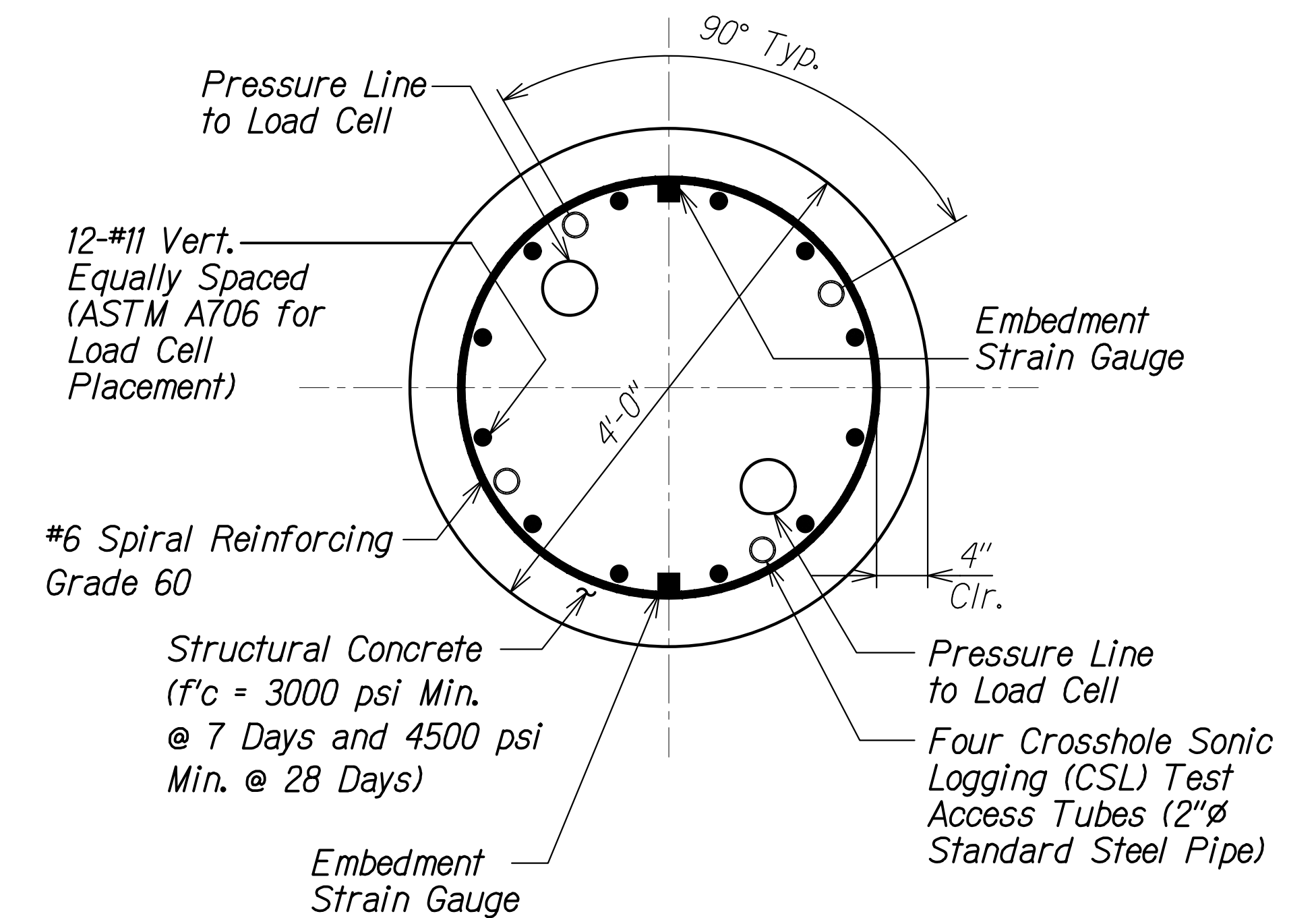
ELEVATION - UPPER PORTION "A"

Scale: Horiz. 1/2" = 1'-0"
Vert. 3/16" = 1'-0"



ELEVATION - LOWER PORTION "B"

Scale: Horiz. 1/2" = 1'-0"
Vert. 3/16" = 1'-0"

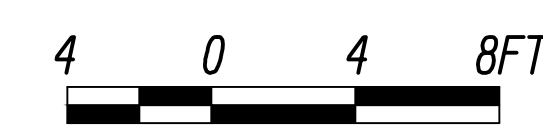


SECTION A-A
Scale: 1" = 1'-0"

GRAPHIC SCALES:



SCALE: 1/2" = 1'-0"



SCALE: 3/16" = 1'-0"



SCALE: 1" = 1'-0"



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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**LOAD TEST SHAFT
SECTION AND ELEVATION**

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

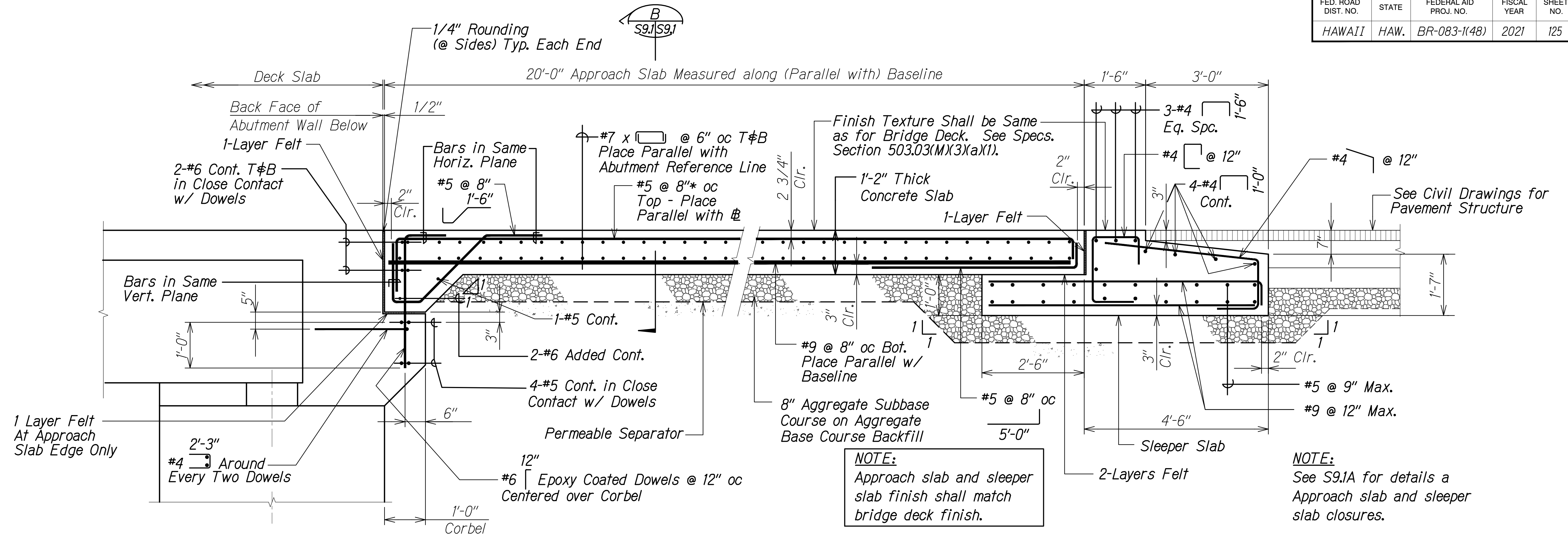
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SHEET No. S83 OF 3 SHEETS

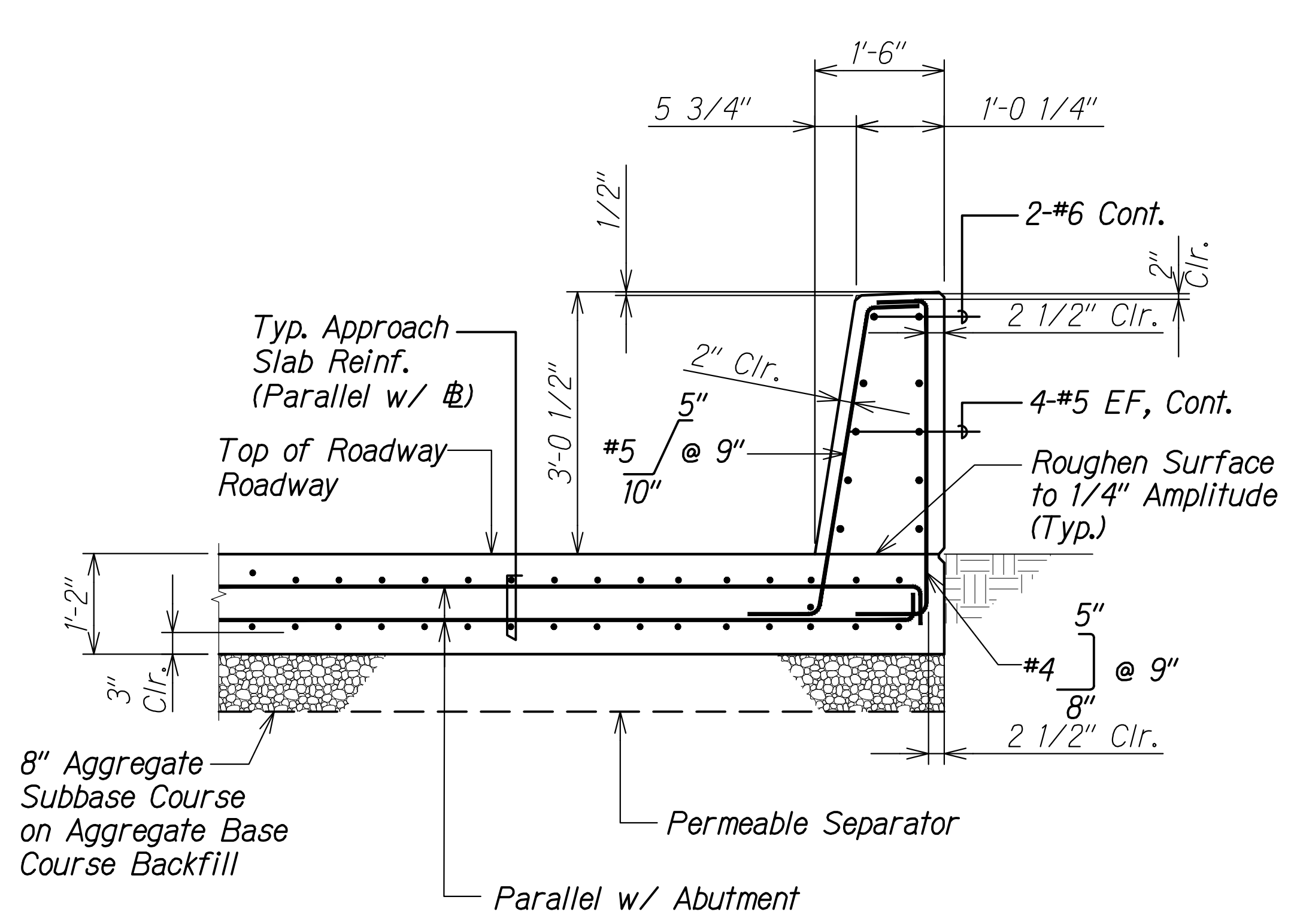
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| NOTED BY | |
| QUANTITIES BY | |
| CHECKED BY | |

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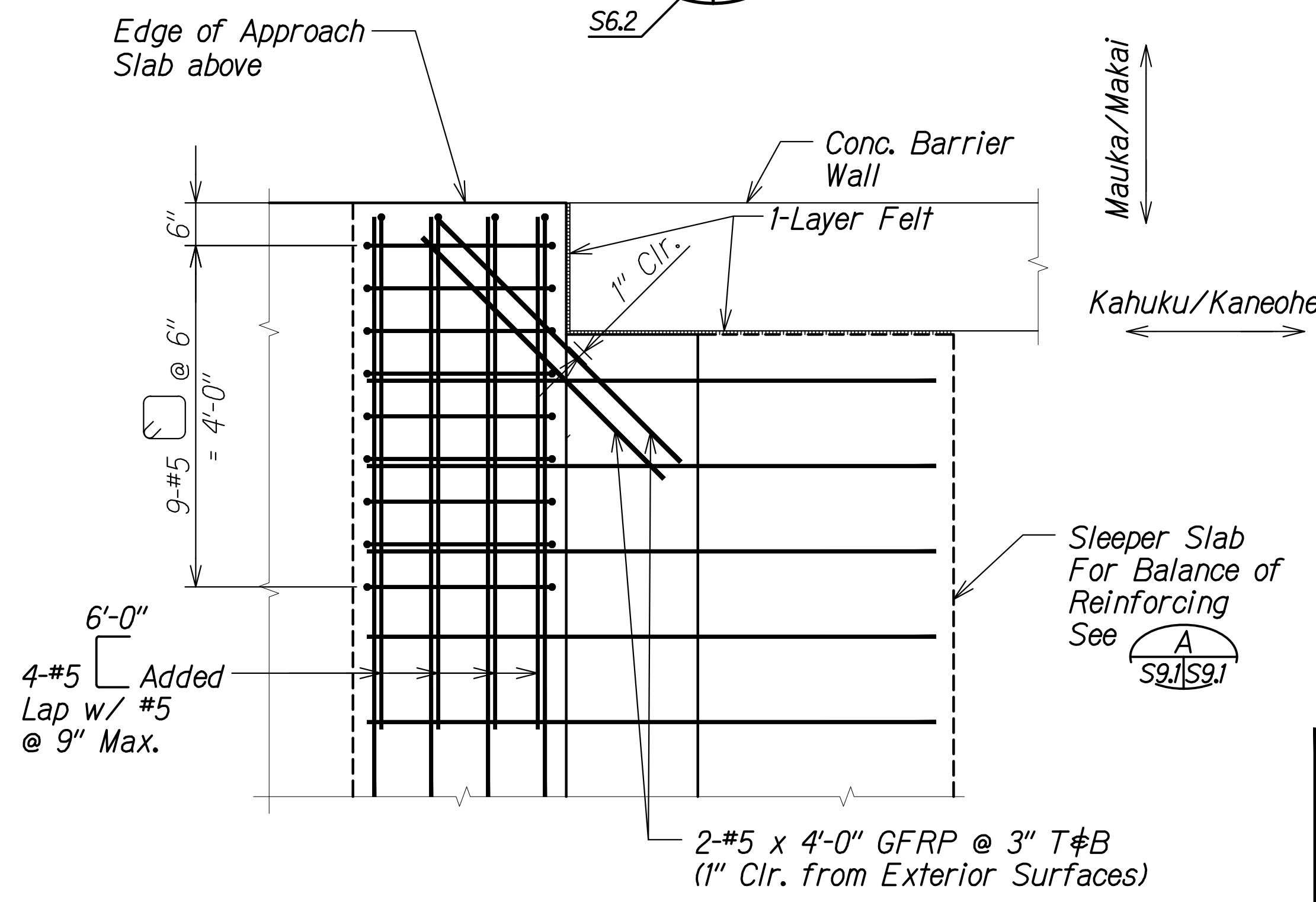
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| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 125 | 161 |



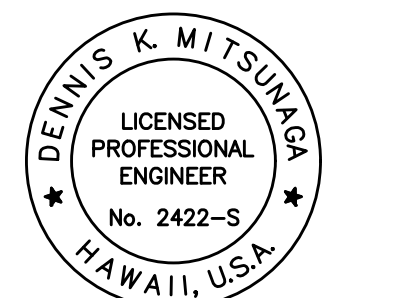
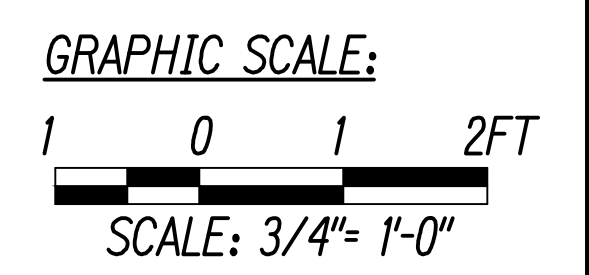
TYPICAL APPROACH SLAB SECTION
Scale: 3/4" = 1'-0"
S6.1/S9.1



SECTION B
Scale: 3/4" = 1'-0"
S9.1/S9.1



SLEEPER SLAB AT CONCRETE BARRIER
Scale: 3/4" = 1'-0"
S3.1/S9.1



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4/30/22
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MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

APPROACH SLAB SECTIONS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

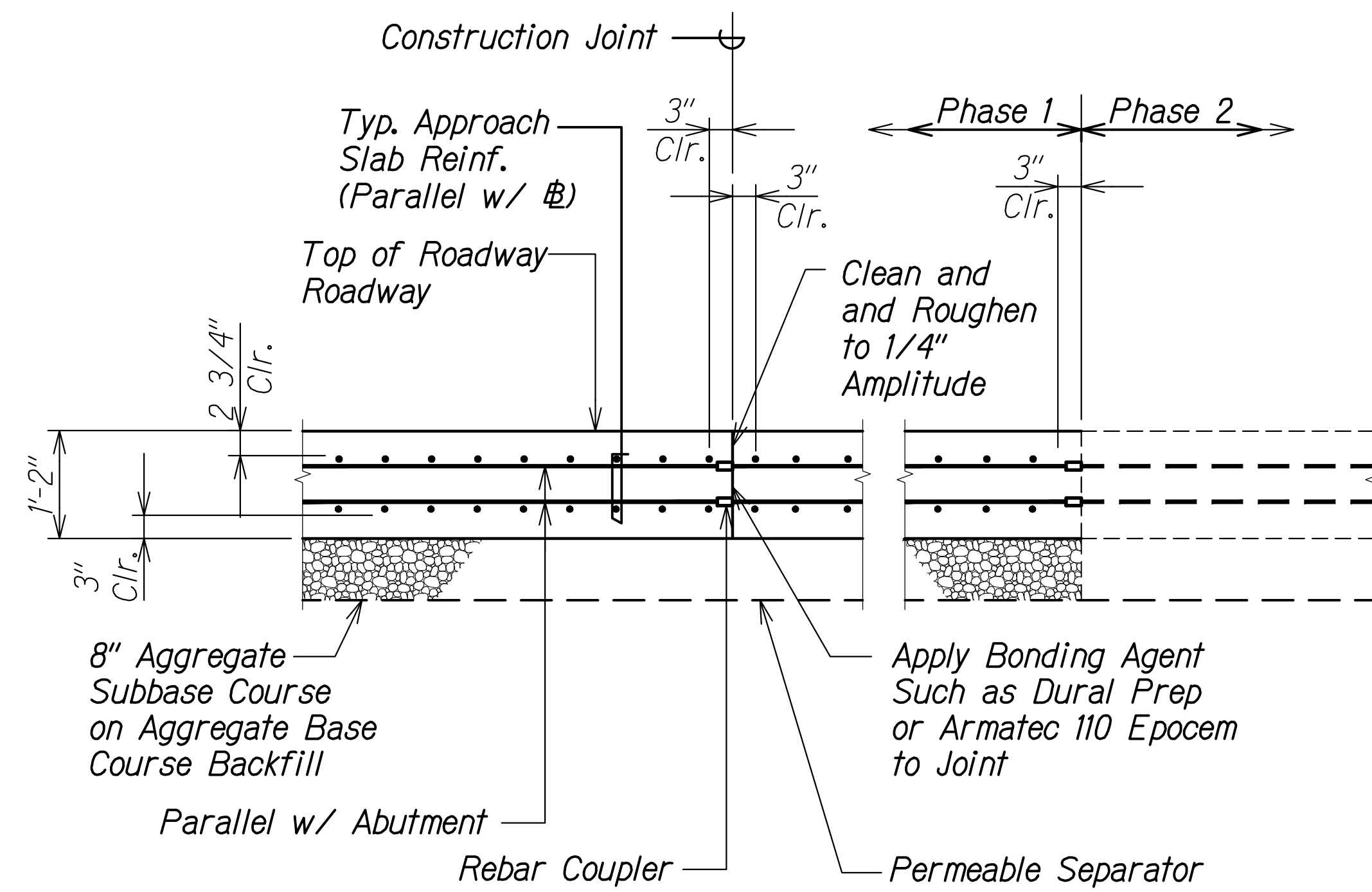
Scale: As Noted Date: February 2021

SHEET No. S9.1 OF 4 SHEETS

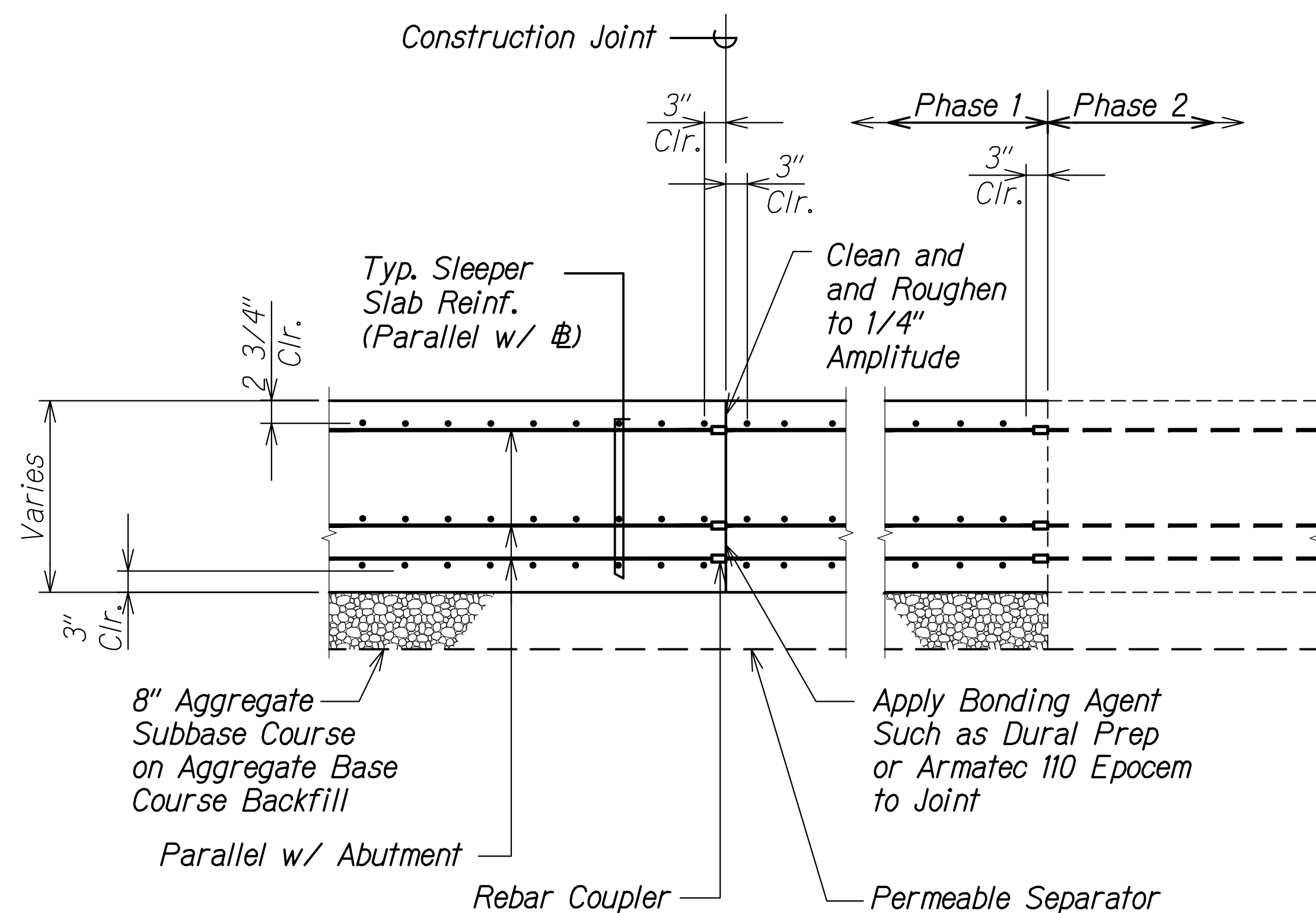
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| ORIGINAL PLAN | DATE |
| NO. | |

DRAWING NAME: I:\PROJECTS\ACTIVE FILES\13-01_KAIPAPAU BRIDGE\REVISED_STRUCTURE\051221\KSB-S901.DWG PLOT TIME: 06-09-21, 3:34 PM

| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-----------------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 126 | 161 |



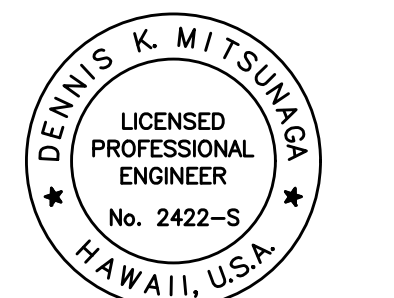
APPROACH SLAB SECTION AT CLOSURE A
 Scale: 3/4" = 1'-0" S9.1A | S9.1A



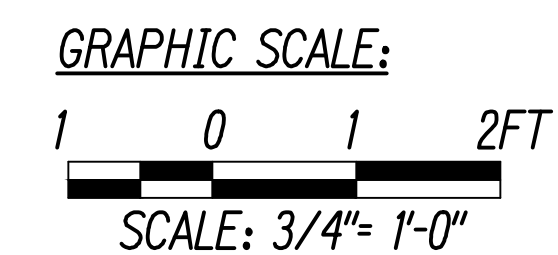
SLEEPER SLAB SECTION AT CLOSURE B
 Scale: 3/4" = 1'-0" S9.1A | S9.1A

| | |
|---------------|------|
| ORIGINAL PLAN | DATE |
| DESIGNED BY | |
| CHECKED BY | |
| NO. | |

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 SIGNATURE: *[Signature]* DATE: 4/30/22
 MITSUNAGA & ASSOCIATES, INC.



STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

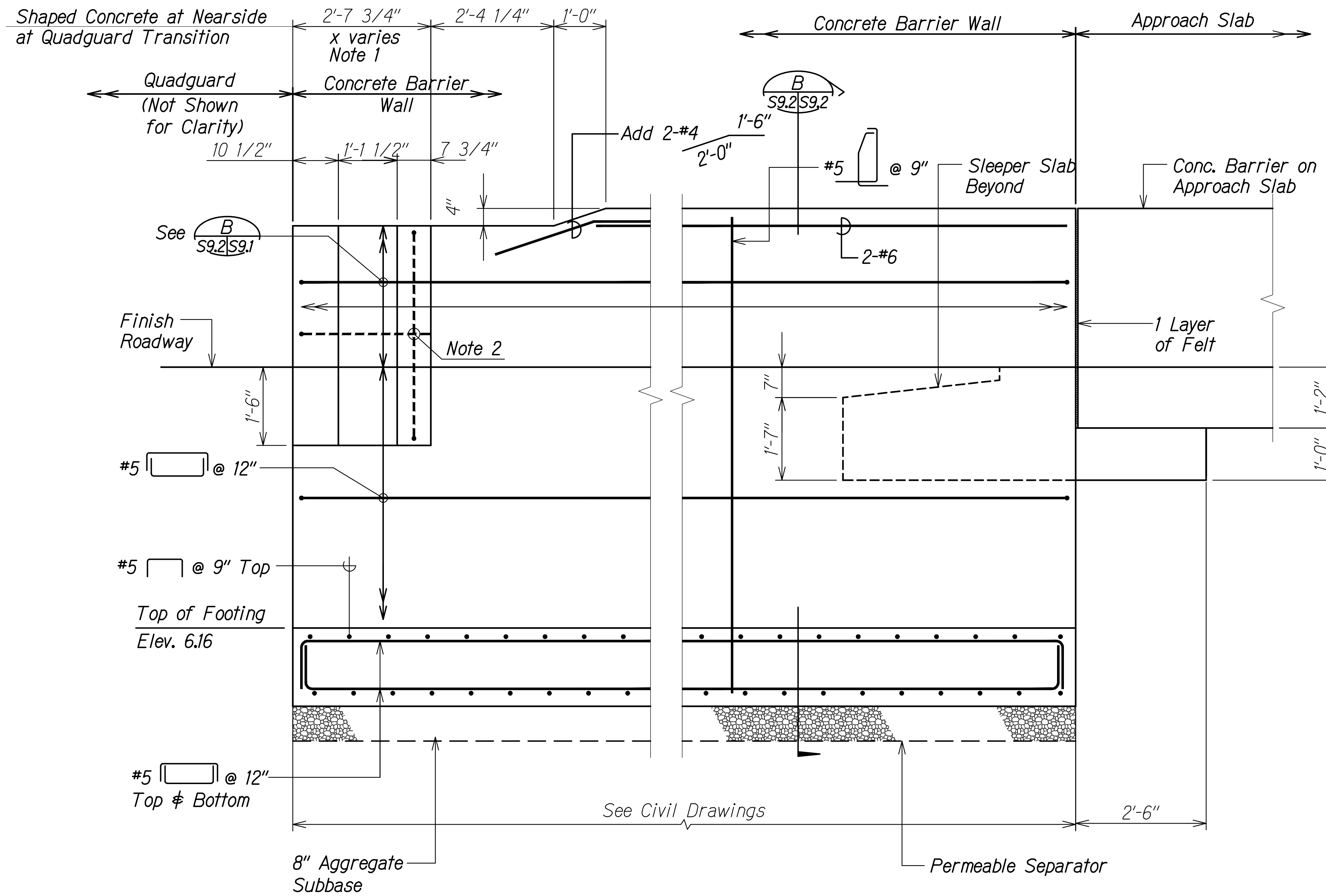
SLAB SECTIONS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

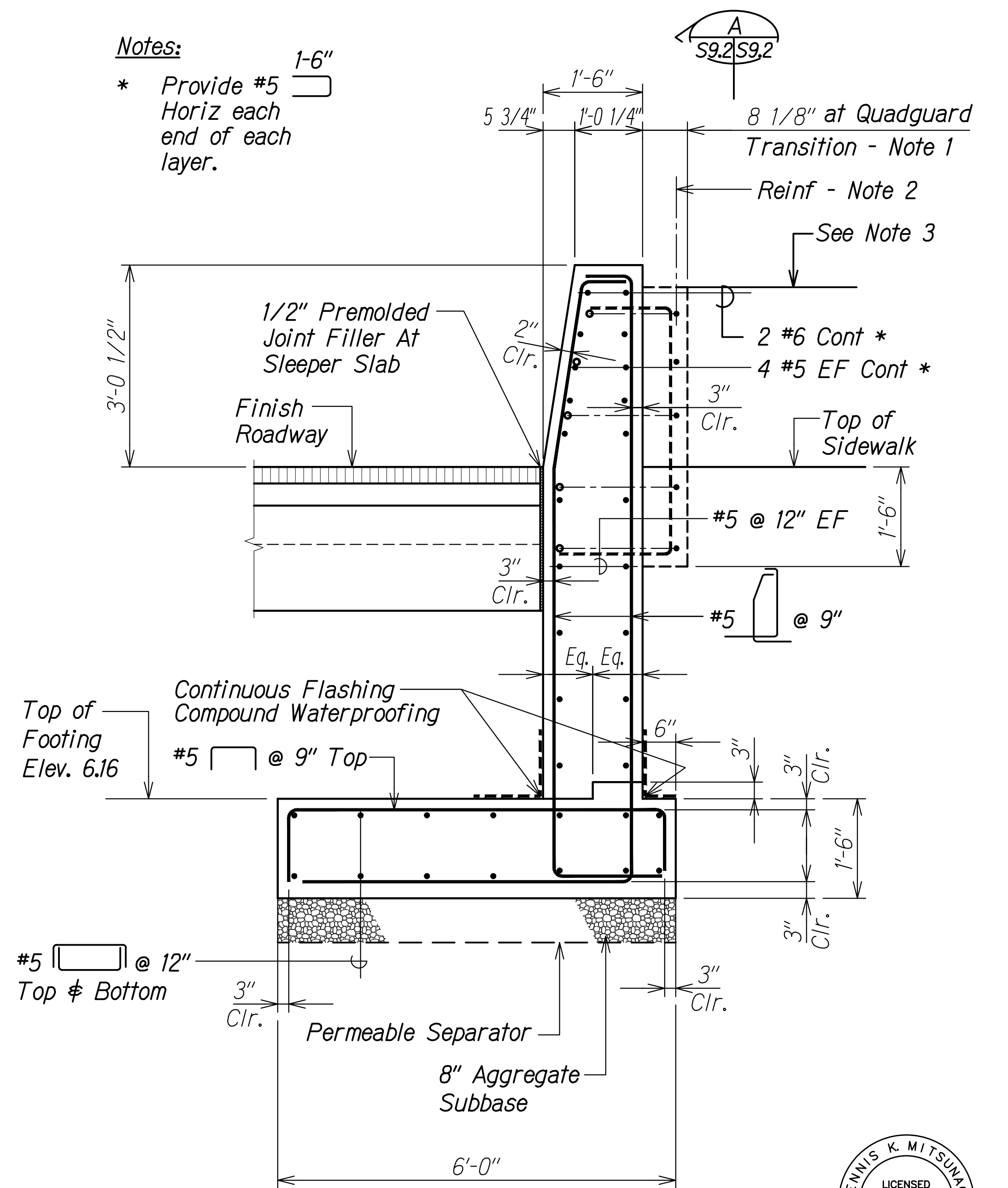
SHEET No. S9.1A OF 4 SHEETS

| | | | | | |
|---------------------|-------|-----------------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 127 | 161 |



Notes:

- * Provide #5 1-6" Horiz each end of each layer.

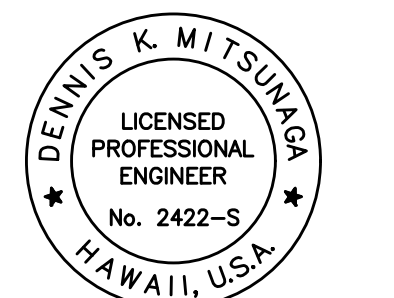
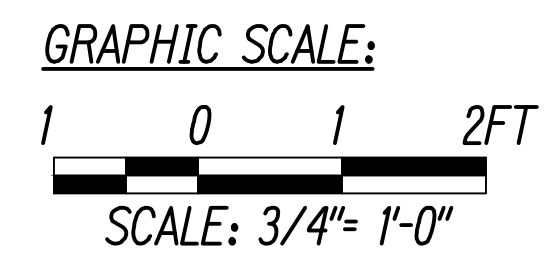


CONCRETE BARRIER WALL
Scale: 3/4" = 1'-0"
S3.1 S9.2 S9.2

SECTION
Scale: 3/4" = 1'-0"
S9.2 S9.2

Notes:

1. At Shaped Concrete at Quadguard Transition, see Civil drawings for layout.
2. Provide #5 @ 9" x Horiz with minimum 6 #5 x Vertical
3. Top of barrier at Quadguard transition.



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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONCRETE BARRIER WALL

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

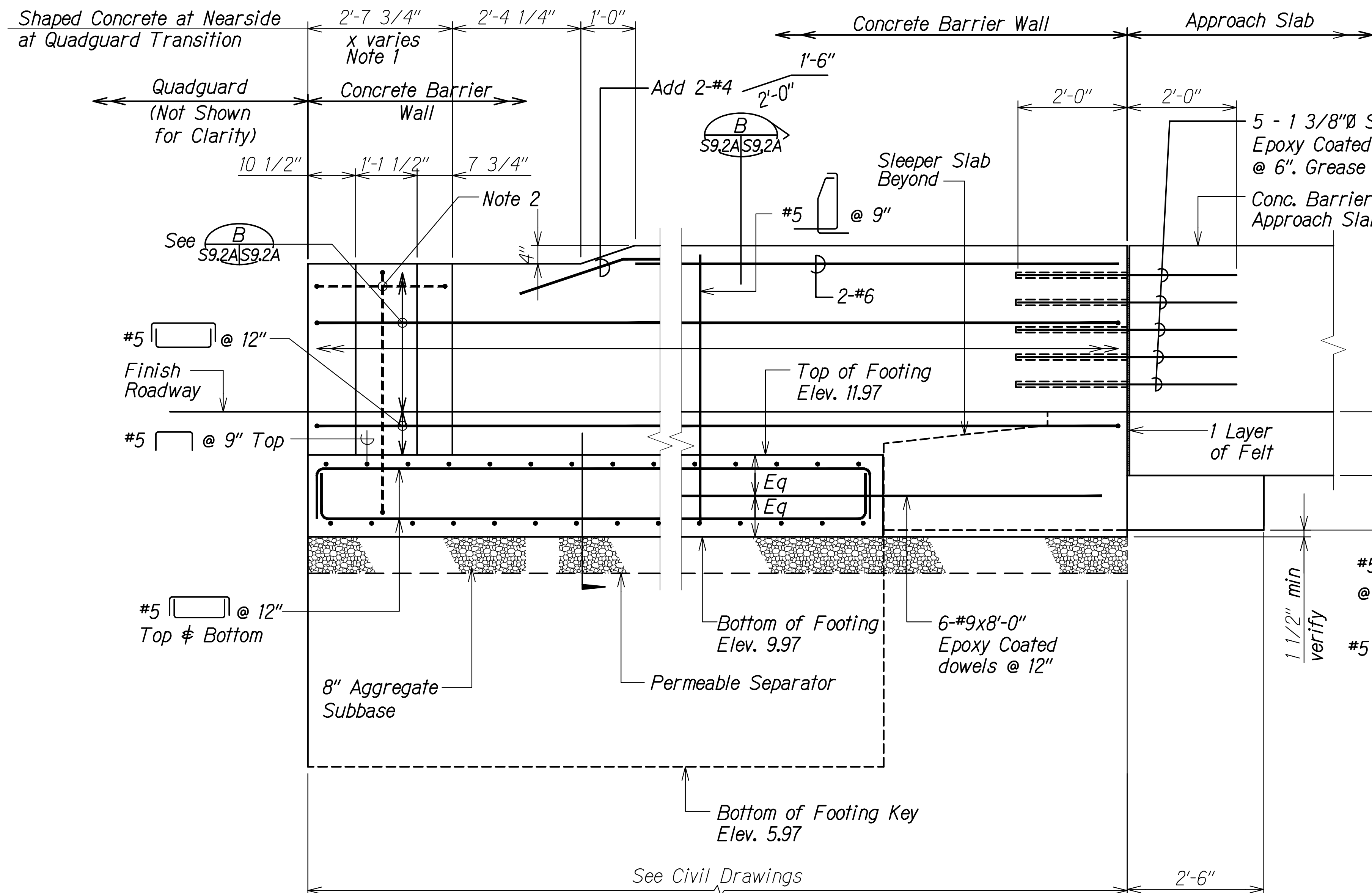
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SHEET No. S92 OF 4 SHEETS

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| ORIGINAL PLAN | DATE |
| CHECKED BY | |
| DESIGNED BY | |
| QUANTITIES BY | |
| NO. | |

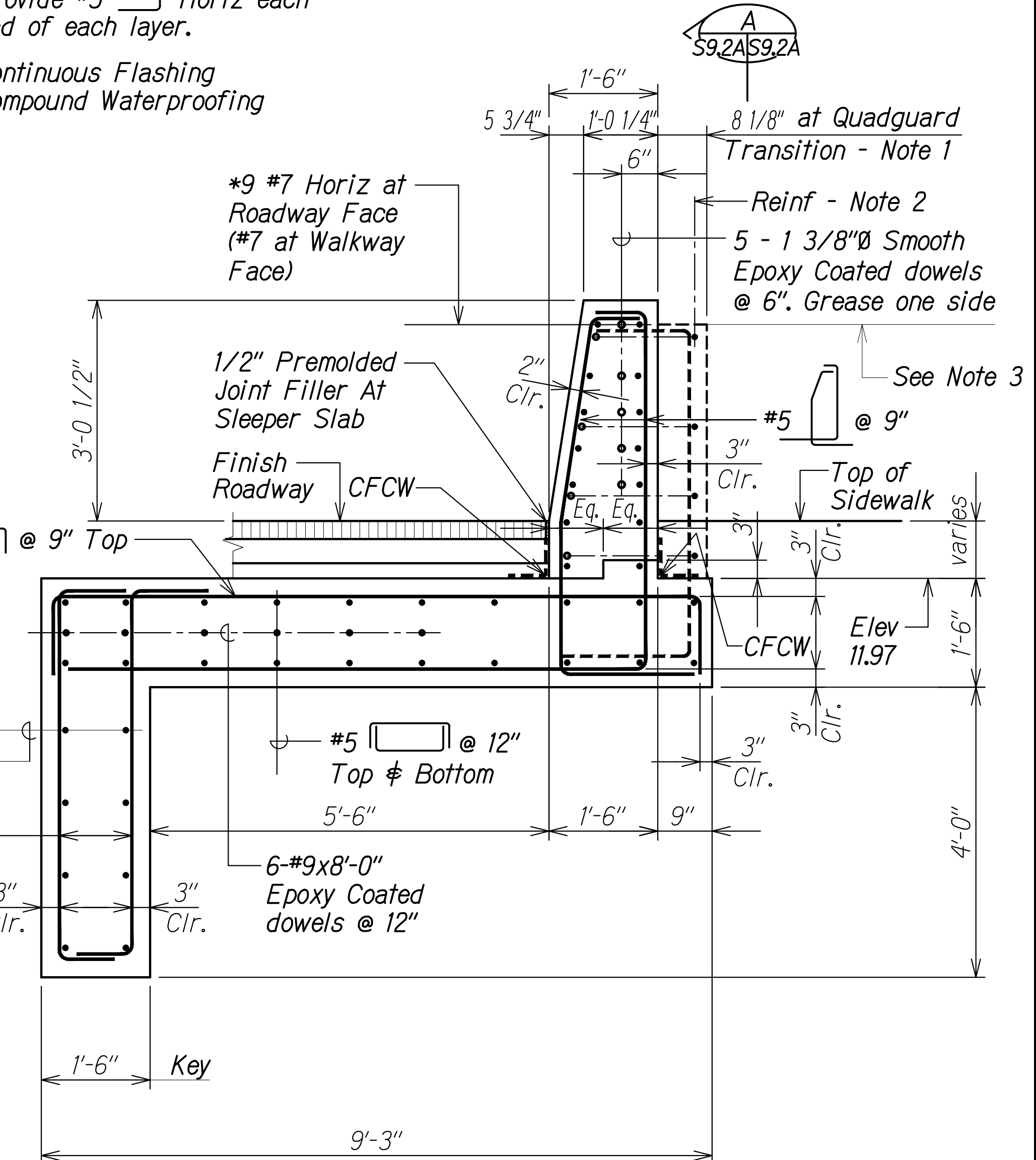
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| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
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| HAWAII | HAW. | BR-083-1(48) | 2021 | 128 | 161 |



Notes:

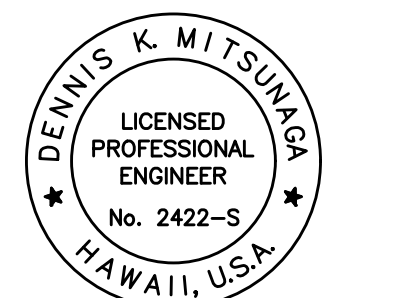
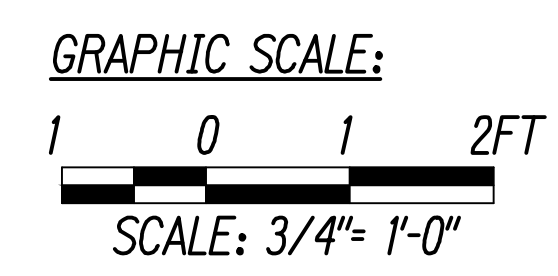
- * Provide #5 \square 1-6" Horiz each end of each layer.
- F Continuous Flashing Compound Waterproofing



CONCRETE BARRIER WALL A
 Scale: 3/4" = 1'-0" S31 | S9.2A

SECTION B
 Scale: 3/4" = 1'-0" S9.2A | S9.2A

- Notes:**
1. At Shaped Concrete at Quadguard Transition, see Civil drawings for layout.
 2. Provide #5 @ 9" x \square Horiz with minimum 6 #5 x \square Vertical
 3. Top of barrier at Quadguard transition.



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 LIC. EXPIRATION: MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
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 HIGHWAYS DIVISION

CONCRETE BARRIER WALL

KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)

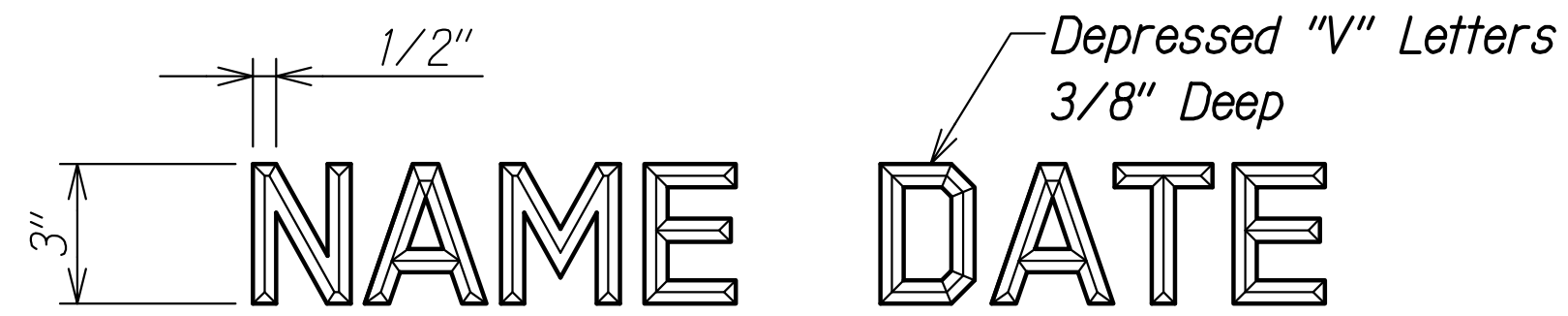
Scale: As Noted Date: February 2021

SHEET No. S9.2A OF 4 SHEETS

| | |
|---------------------|-------------------|
| ORIGINAL PLAN | DATE |
| NO. _____ | _____ |
| CHECKED BY _____ | DESIGNED BY _____ |
| QUANTITIES BY _____ | TRACED BY _____ |
| DATE _____ | DATE _____ |

DRAWING NAME: T:\PROJECTS\ACTIVE FILES\13-01-KAIPAPAU BRIDGE\REVISED-STRUCT\13-051221\KSB-S902A.DWG PLOT TIME: 06-09-21, 3:36 PM

| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-----------------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 129 | 161 |



Name of Bridge

Date of Year Built

NOTES:

1. Exact details and spacing of letter and figures and location shall be as directed by the Engineer. Gothic letters and figures approximating the dimensions shown will be acceptable if approved by the Engineer.
2. Name & date shall be place on the trailing (exit) end post on each side of bridge.
3. Unless otherwise directed by the Engineer, The name of the bridge shall be "KA'IPAPAU STREAM BRIDGE". The year shall be the year at completion.

TYPICAL DETAIL OF LETTERS AND FIGURES

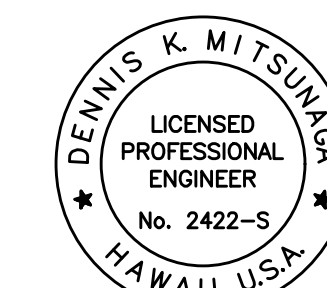
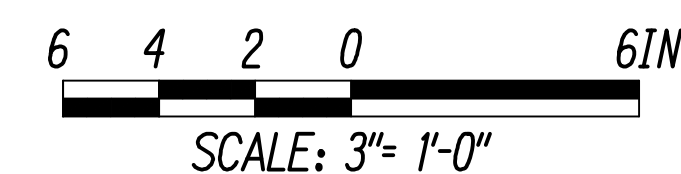
BRIDGE IDENTIFICATION DETAIL 

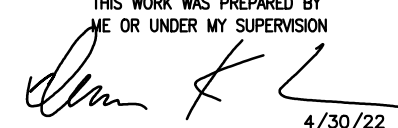
Scale: 3" = 1'-0"

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| ORIGINAL PLAN | DATE |
| DESIGNED BY | |
| CHECKED BY | |
| DATE | |
| DESIGNED BY | |
| CHECKED BY | |
| DATE | |
| DESIGNED BY | |
| CHECKED BY | |
| DATE | |

DRAWING NAME: T:\PROJECTS\ACTIVE FILES\13-01-KAIPAPAU BRIDGE\REVISED_STRUCTURE\BRIDGE_S10.1 SW FIXED.DWG PLOT TIME: 06-09-21, 3:37 PM

GRAPHIC SCALE:



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STATE OF HAWAII
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 HIGHWAYS DIVISION

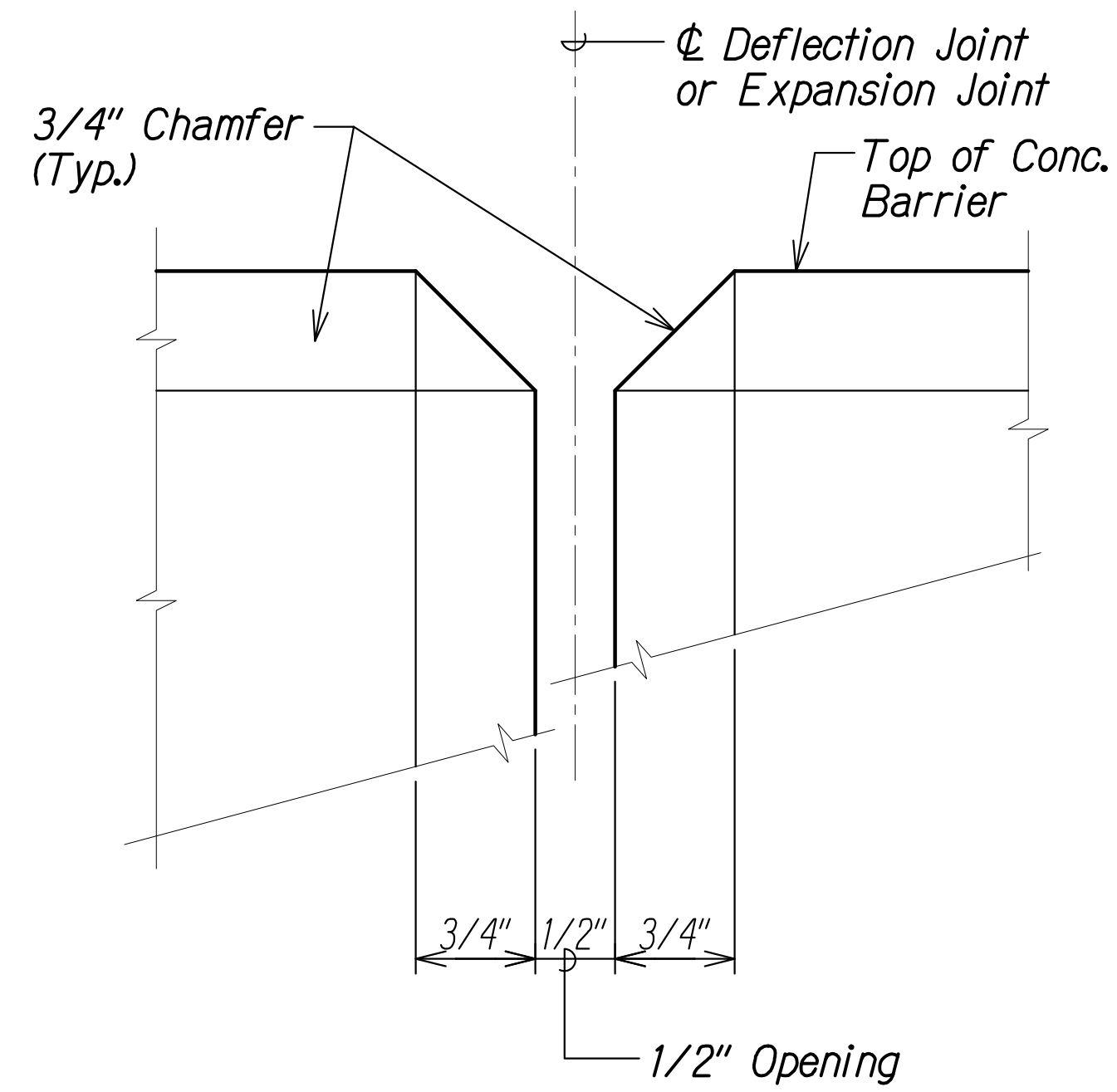
BRIDGE IDENTIFICATION
DETAIL

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

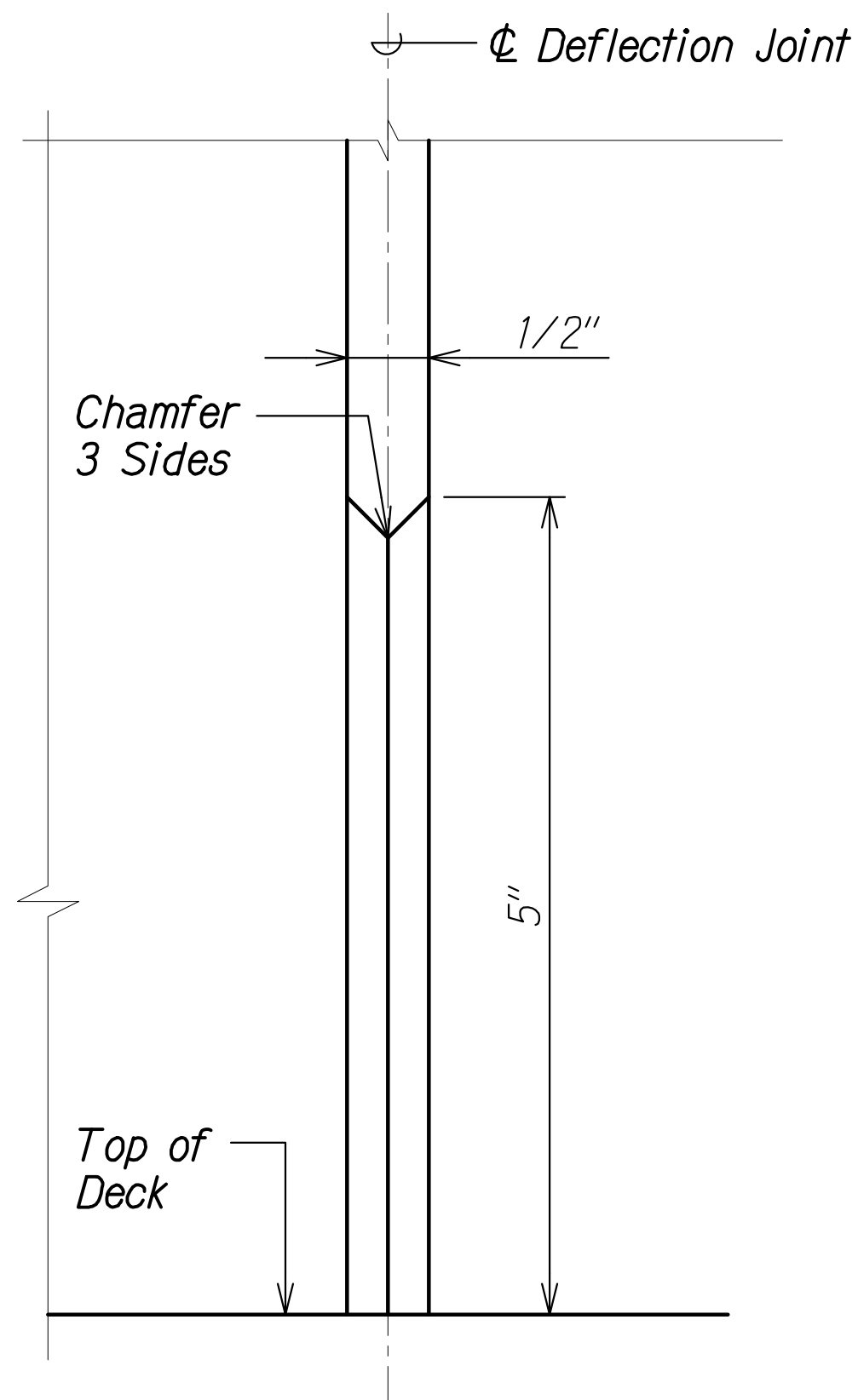
Scale: As Noted Date: February 2021

SHEET No. S10.1 OF 7 SHEETS

| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-----------------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 130 | 161 |



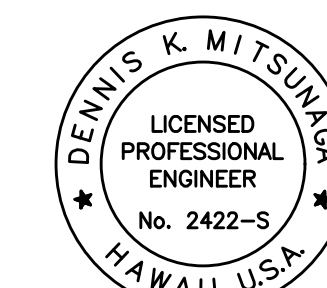
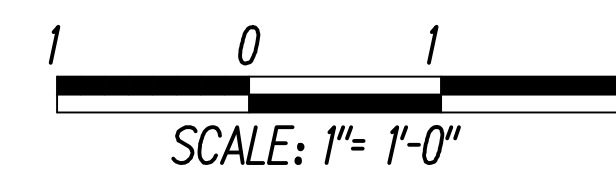
JOINT DETAIL 1
Scale: 1" = 1'-0" S10.2 | S10.2



JOINT DETAIL 2
Scale: 1" = 1'-0" S10.2 | S10.2

Note:
Align joints in concrete barrier with 1/2" joints in Aesthetic Railing.

GRAPHIC SCALE:



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Dennis K. Mitsunaga
SIGNATURE LIC. EXPIRATION 4/30/22
MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL JOINT DETAILS

**KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)**

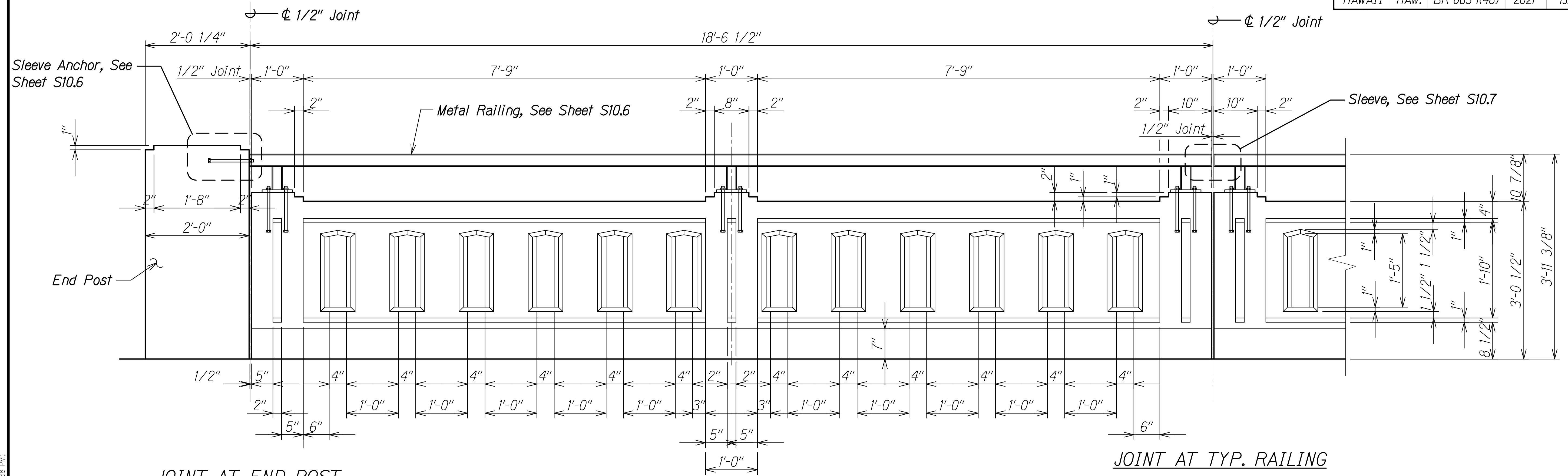
Scale: As Noted Date: February 2021

SHEET No. S10.2 OF 7 SHEETS

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|---------------|------|
| ORIGINAL PLAN | DATE |
| DESIGNED BY | |
| CHECKED BY | |
| NO. _____ | |

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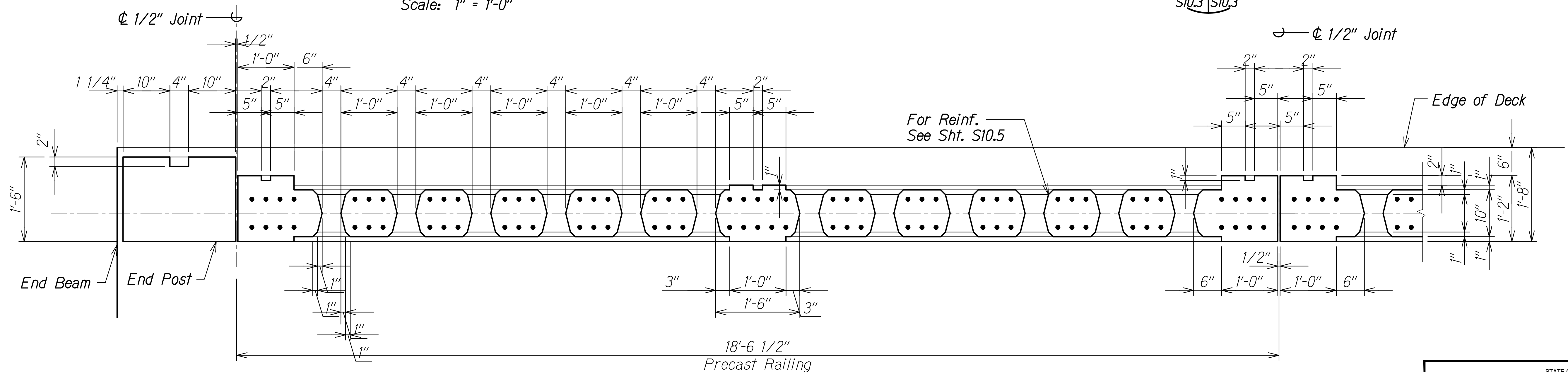
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|---------------------|-------|-----------------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 131 | 161 |



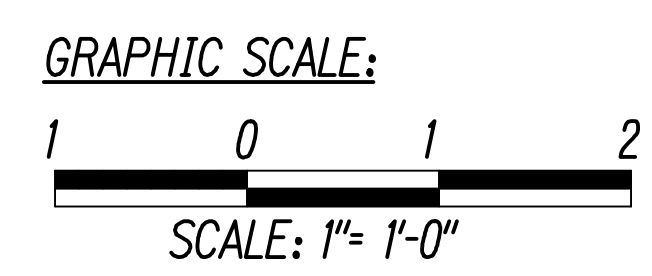
JOINT AT END POST

JOINT AT TYP. RAILING

TYPICAL AESTHETIC BRIDGE RAILING END PANEL ELEVATION A
Scale: 1" = 1'-0" S10.3 S10.3



TYPICAL AESTHETIC BRIDGE RAILING END PANEL PLAN / SECTION A
Scale: 1" = 1'-0" S10.4 S10.4



DENNIS K. MITSUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 2422-S
HAWAII, U.S.A.
4/30/22
SIGNATURE LIC. EXPIRATION
MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**RAILING ELEVATION
AND PLAN AT END PANEL**

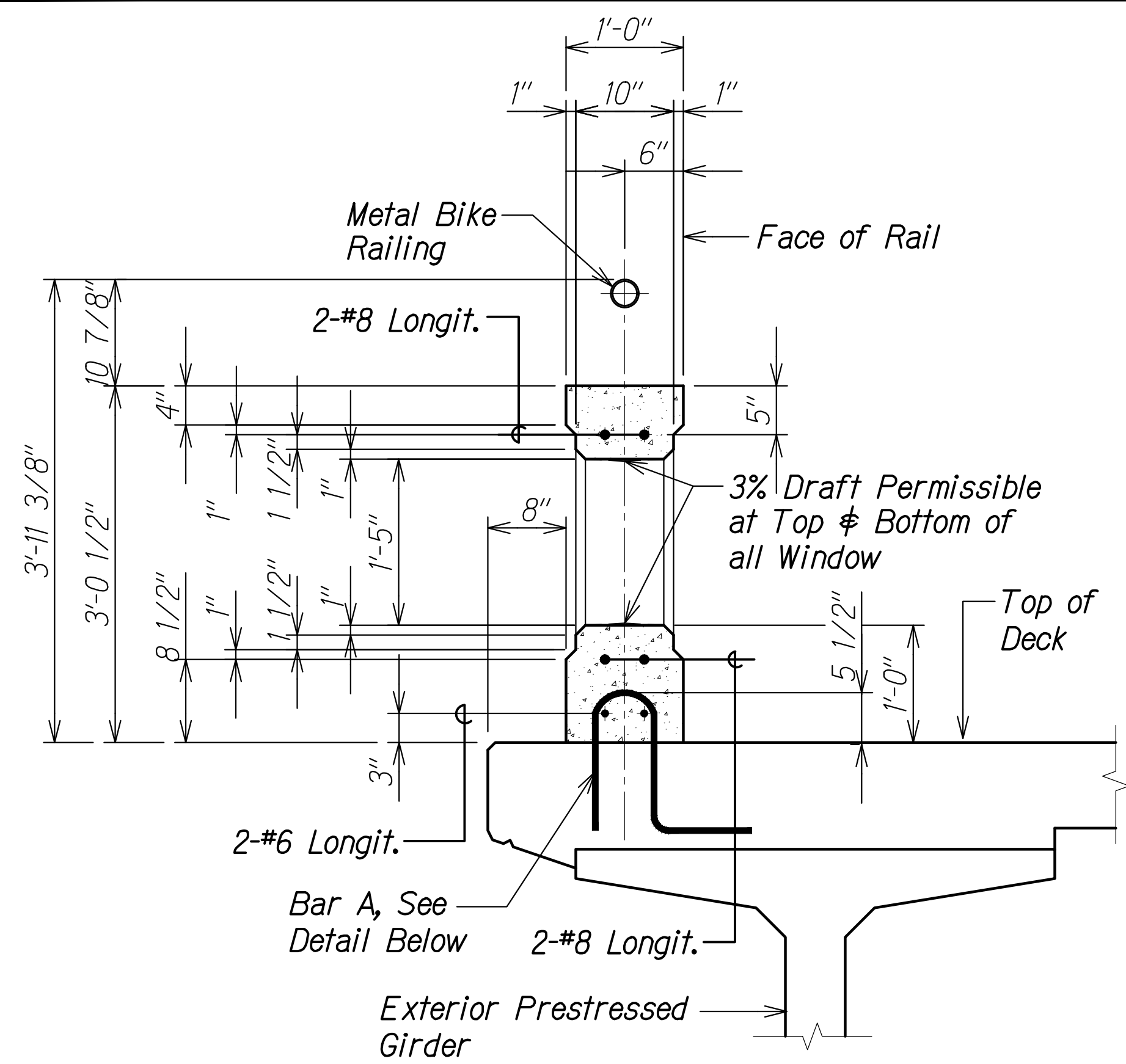
KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021
SHEET No. S10.3 OF 7 SHEETS

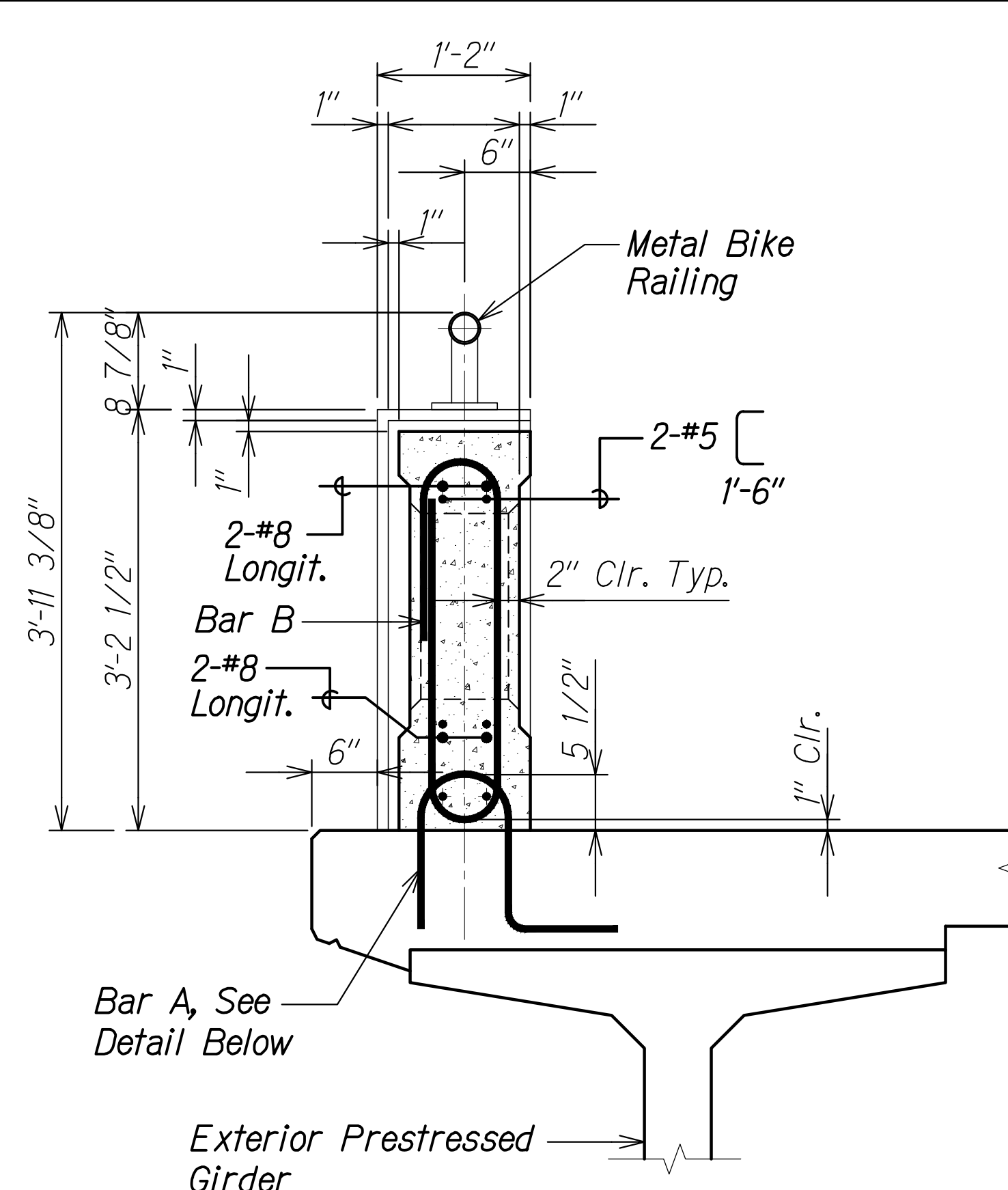
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| ORIGINAL PLAN | DATE |
| NO. _____ | _____ |
| CHECKED BY | DATE |
| DESIGNED BY | _____ |
| QUANTITIES BY | _____ |
| REVISIONS | _____ |

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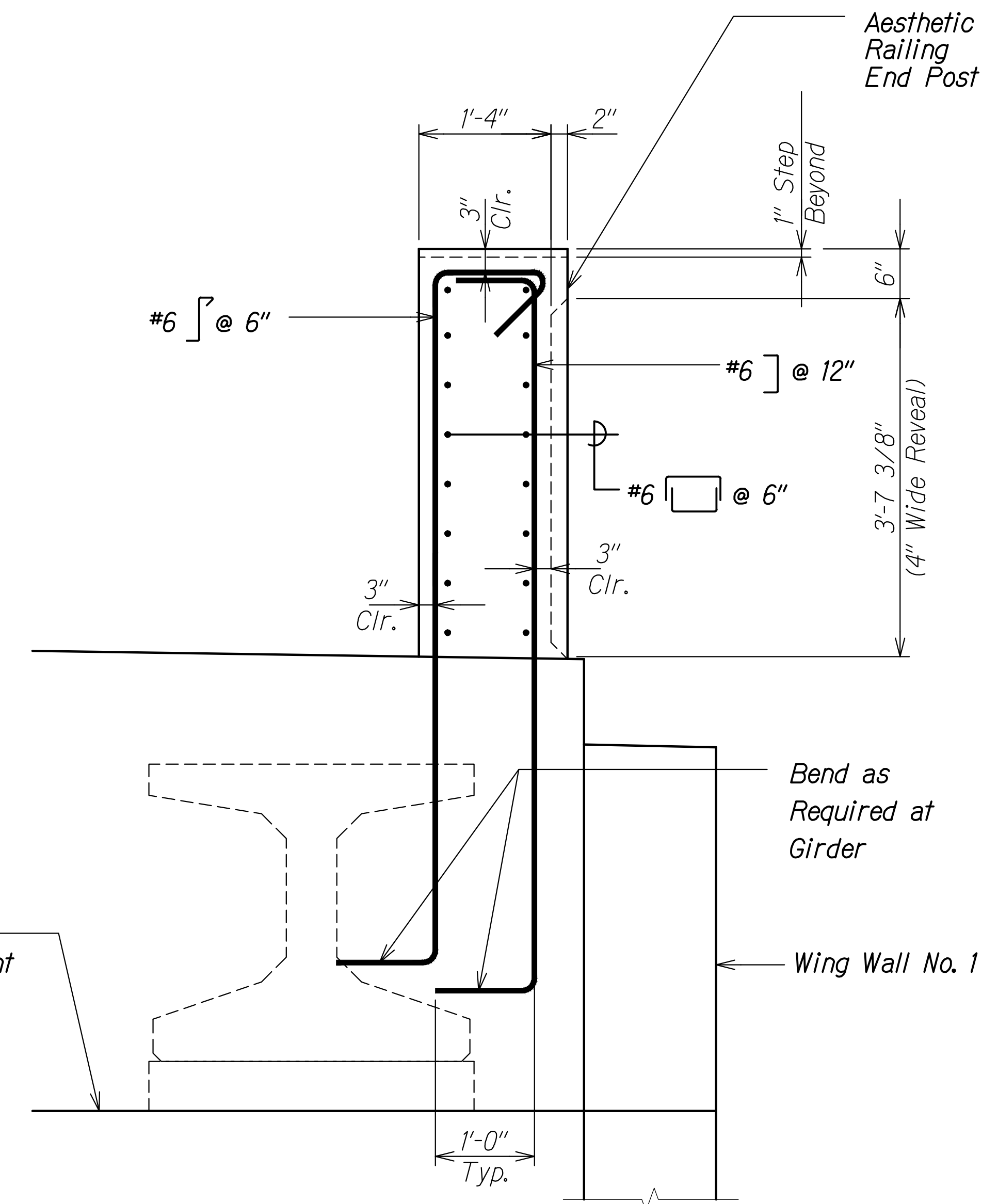
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|---------------------|-------|-----------------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 133 | 161 |



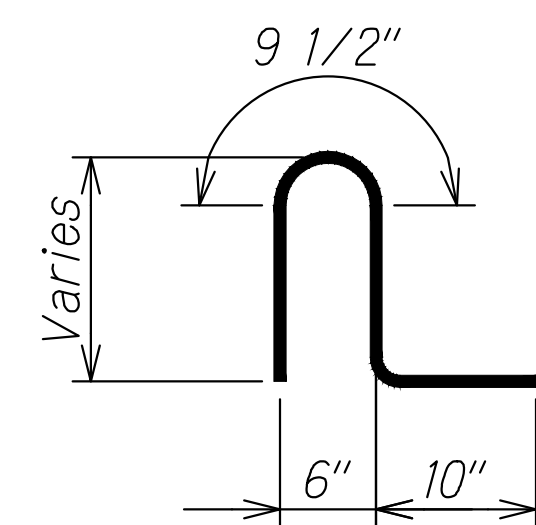
SECTION THRU WINDOW A
Scale: 1" = 1'-0" S10.5 S10.5



SECTION THRU POST B
Scale: 1" = 1'-0" S10.5 S10.5

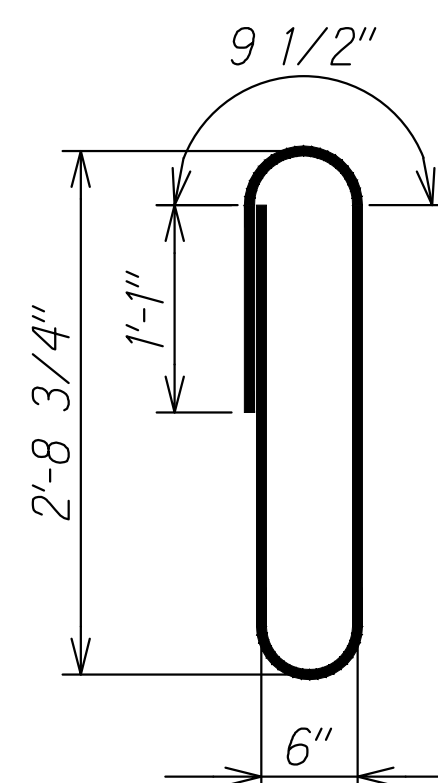


SECTION THRU END POST D
Scale: 1" = 1'-0" S10.5 S10.5

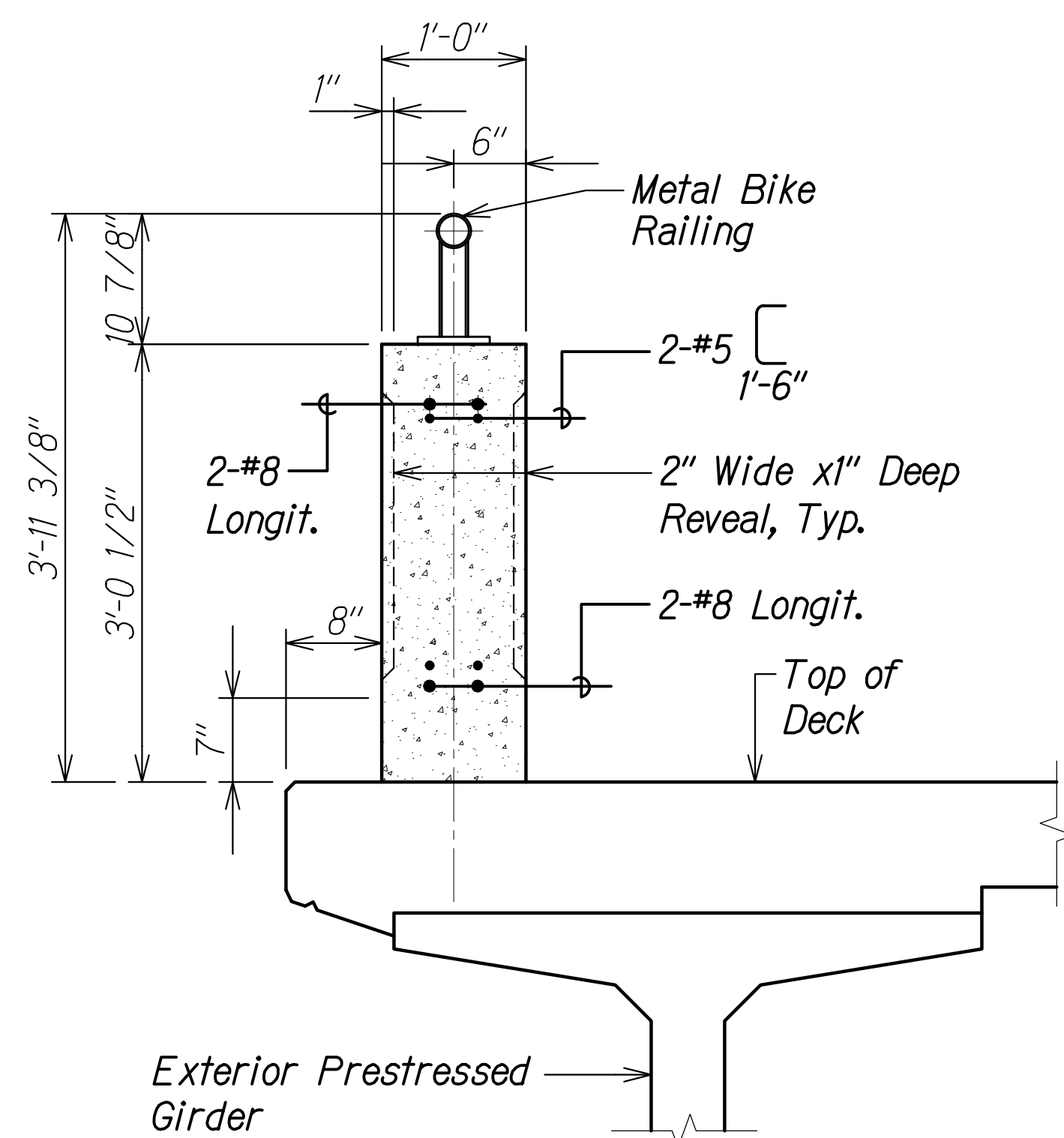


NOTE:
Bar A shall be plumb

BAR A (#5) DETAIL 1
Scale: 1" = 1'-0" S10.5 S10.5



BAR B (#5) DETAIL 2
Scale: 1" = 1'-0" S10.5 S10.5

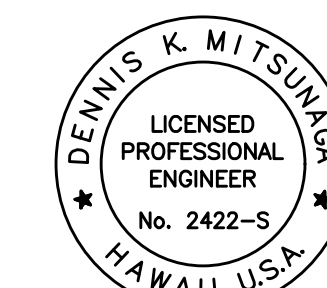
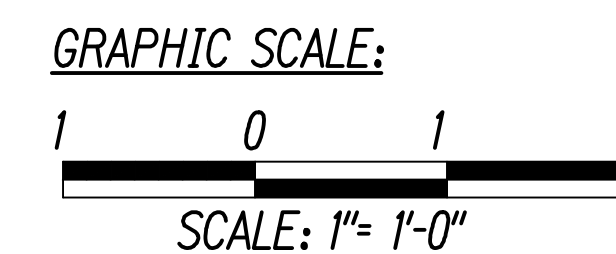


SECTION THRU INTERMEDIATE POST C
Scale: 1" = 1'-0" S10.5 S10.5

Top of Abutment Cap

NOTE:

Stainless Steel reinforcing shall be provided at the Aesthetic Bridge Railings. See General Note 4.(L) on sheet S0.3. Bar A shall also be Stainless Steel.



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RAILING SECTIONS AND DETAILS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

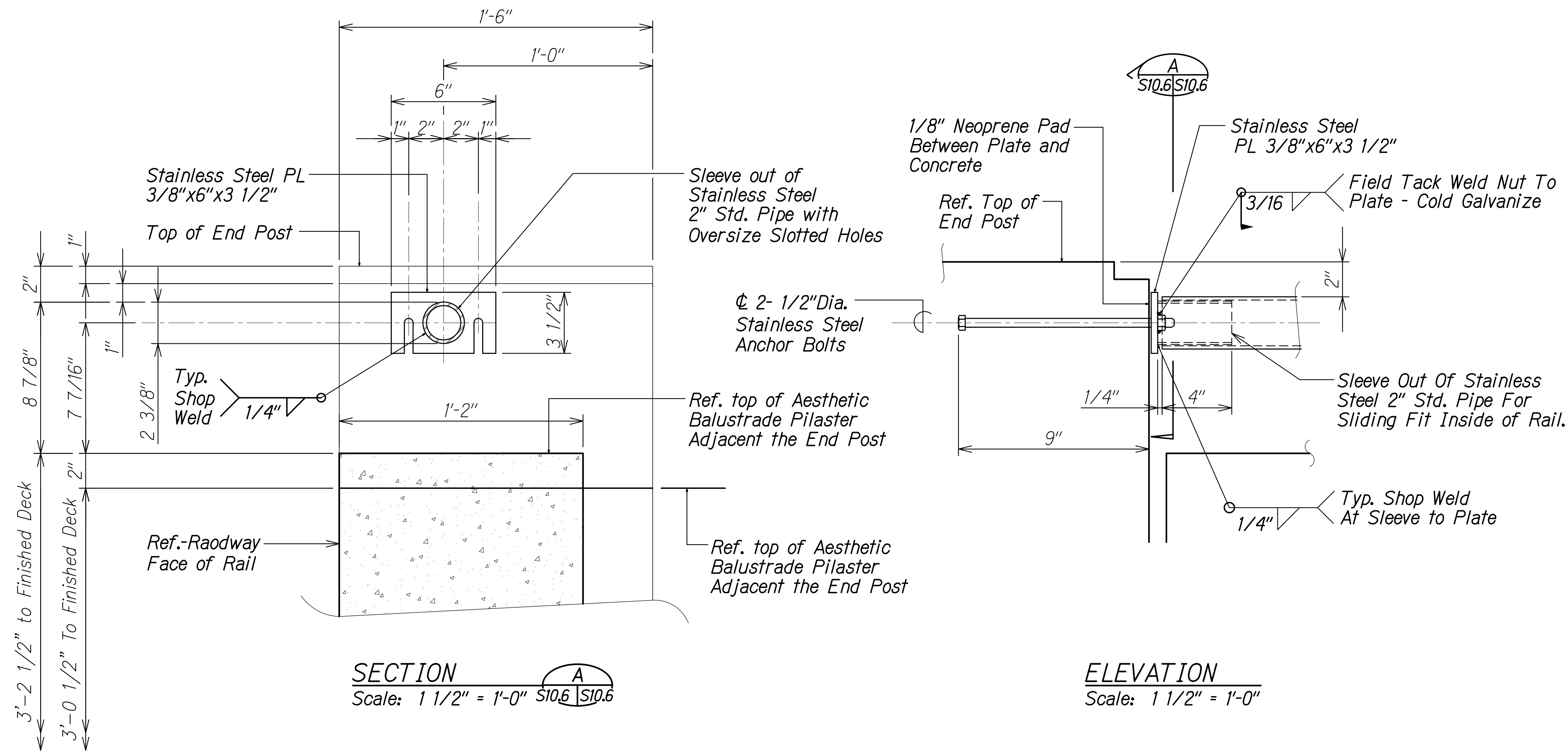
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SHEET No. S10.5 OF 7 SHEETS

| | |
|---------------------|-------------------|
| ORIGINAL PLAN | DATE |
| NO. _____ | _____ |
| CHECKED BY _____ | DESIGNED BY _____ |
| QUANTITIES BY _____ | TRACED BY _____ |
| DATE _____ | DATE _____ |

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| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
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| HAWAII | HAW. | BR-083-1(48) | 2021 | 134 | 161 |



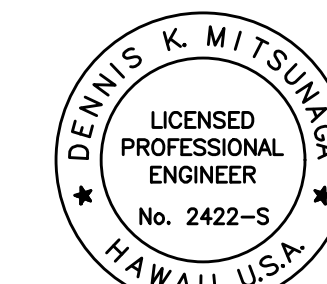
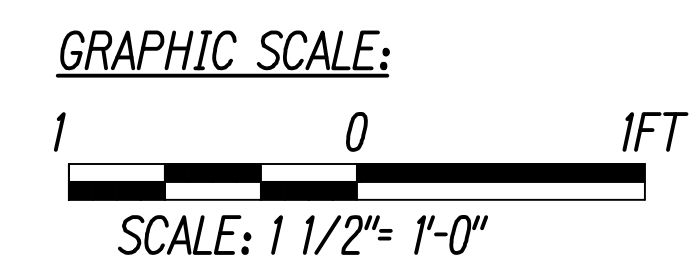
SECTION
Scale: 1 1/2" = 1'-0" A

ELEVATION
Scale: 1 1/2" = 1'-0"

RAIL SLEEVE ANCHOR AT END POST CONNECTION DETAIL

| | |
|---------------|------|
| DESIGNED BY | DATE |
| DRAWN BY | |
| CHECKED BY | |
| QUANTITIES BY | |
| NOTED BY | |
| NO. | |

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STATE OF HAWAII
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HIGHWAYS DIVISION

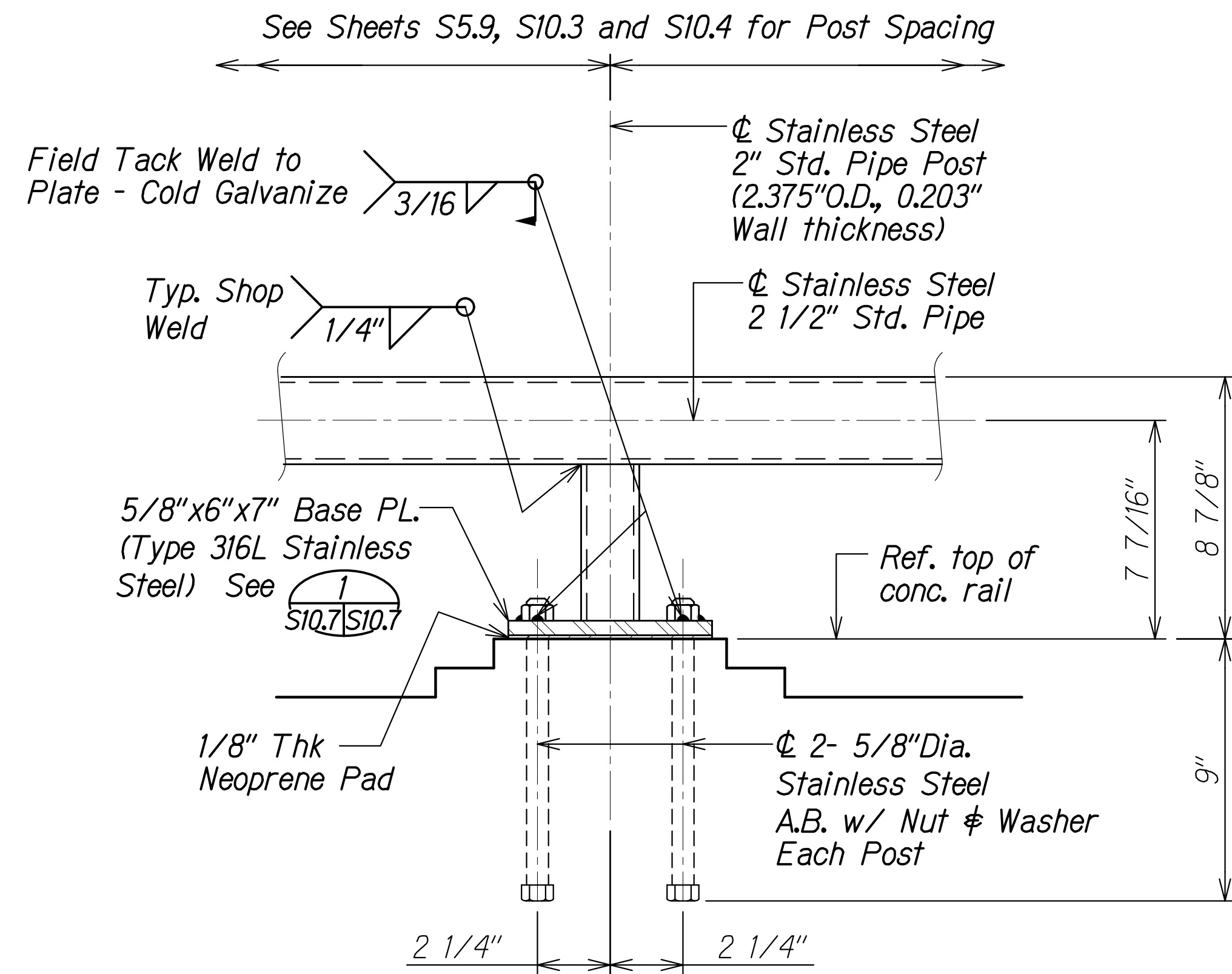
METAL BIKE RAILING DETAILS

**KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)**

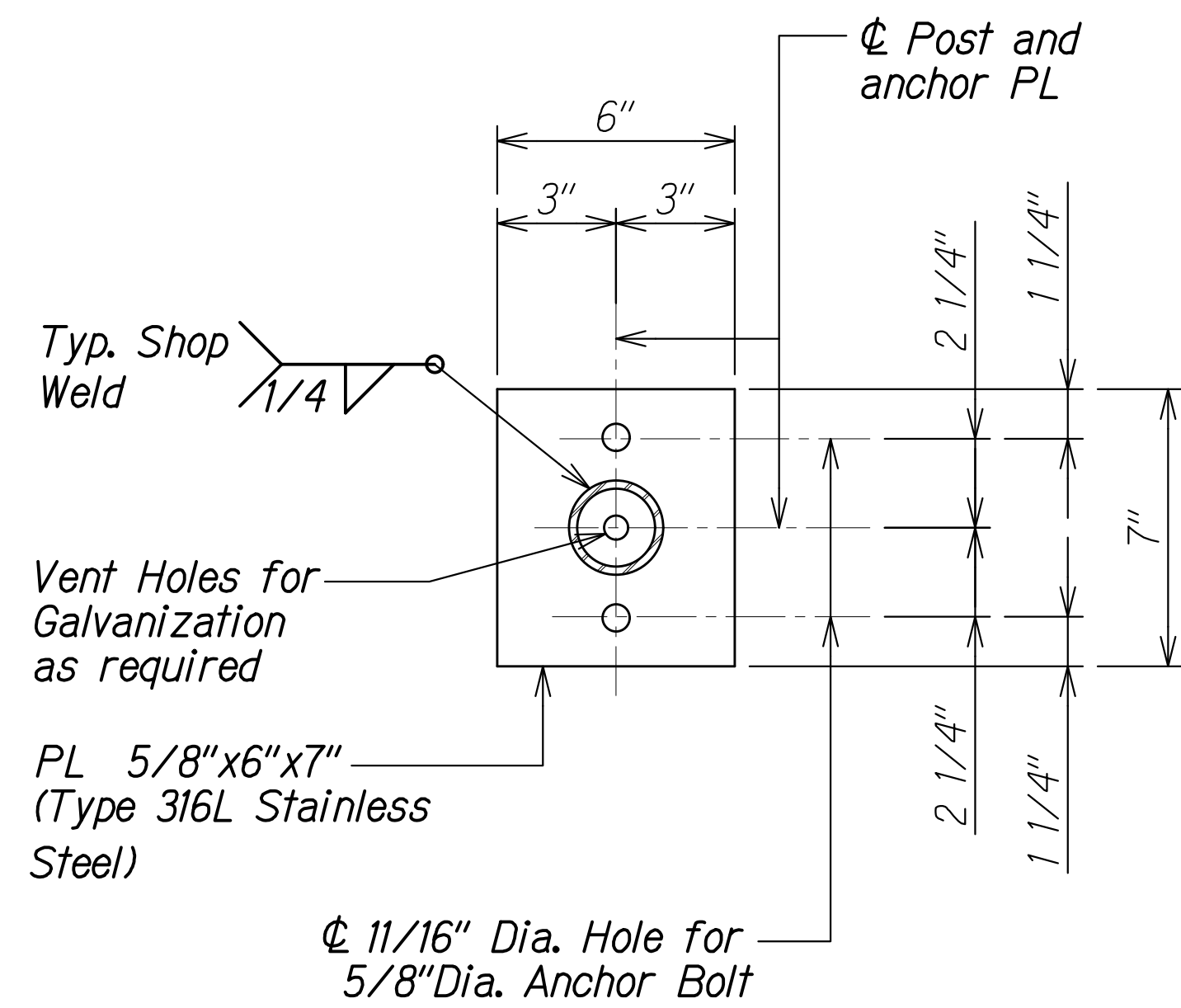
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SHEET No. S106 OF 7 SHEETS

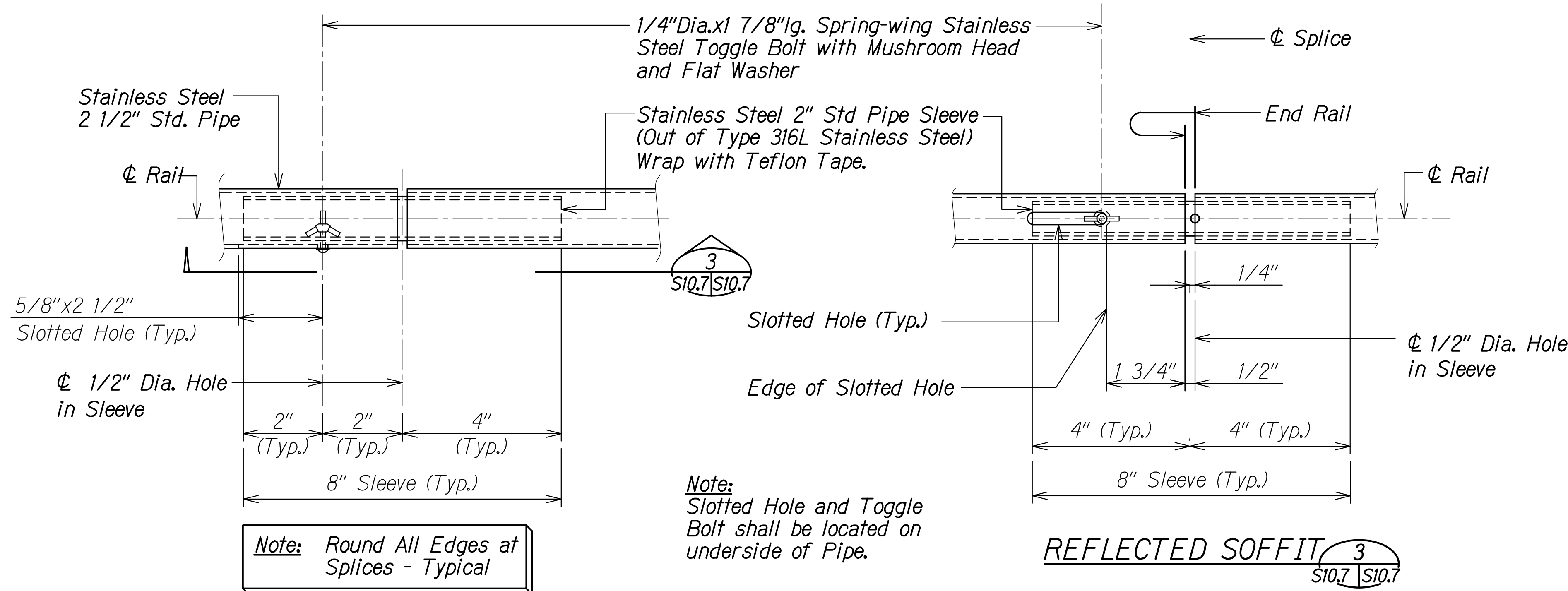
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|---------------------|-------|-----------------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 135 | 161 |



ELEVATION A
Scale: 3" = 1'-0" S10.7 | S10.7



ANCHOR PLATE DETAIL 1
Scale: 3" = 1'-0" S10.6 | S10.6

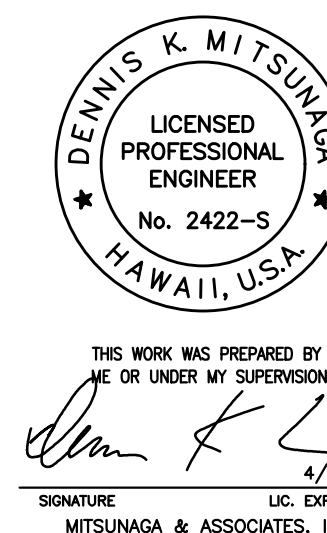
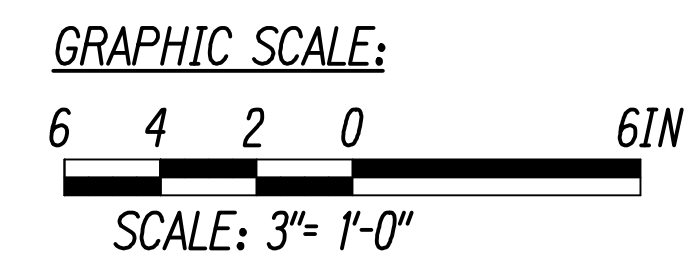


ELEVATION

TYPICAL TUBE SPLICE DETAIL 2
Not to Scale S10.7 | S10.7

REFLECTED SOFFIT 3
S10.7 | S10.7

METAL RAILING ON AESTHETIC BRIDGE RAILING



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

METAL BIKE RAILING DETAILS

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

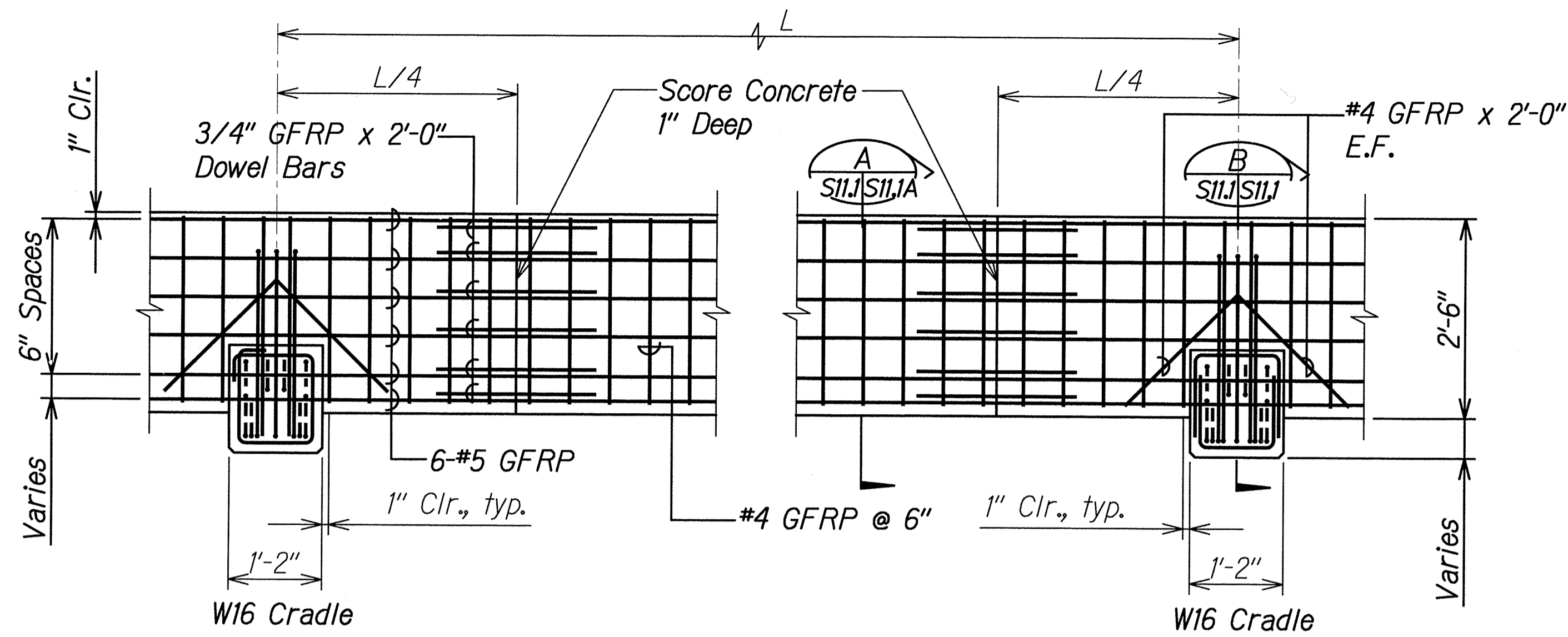
Scale: As Noted Date: February 2021

SHEET No. S10.7 OF 7 SHEETS

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| ORIGINAL PLAN | DATE |
| DESIGNED BY | |
| CHECKED BY | |
| NO. | |

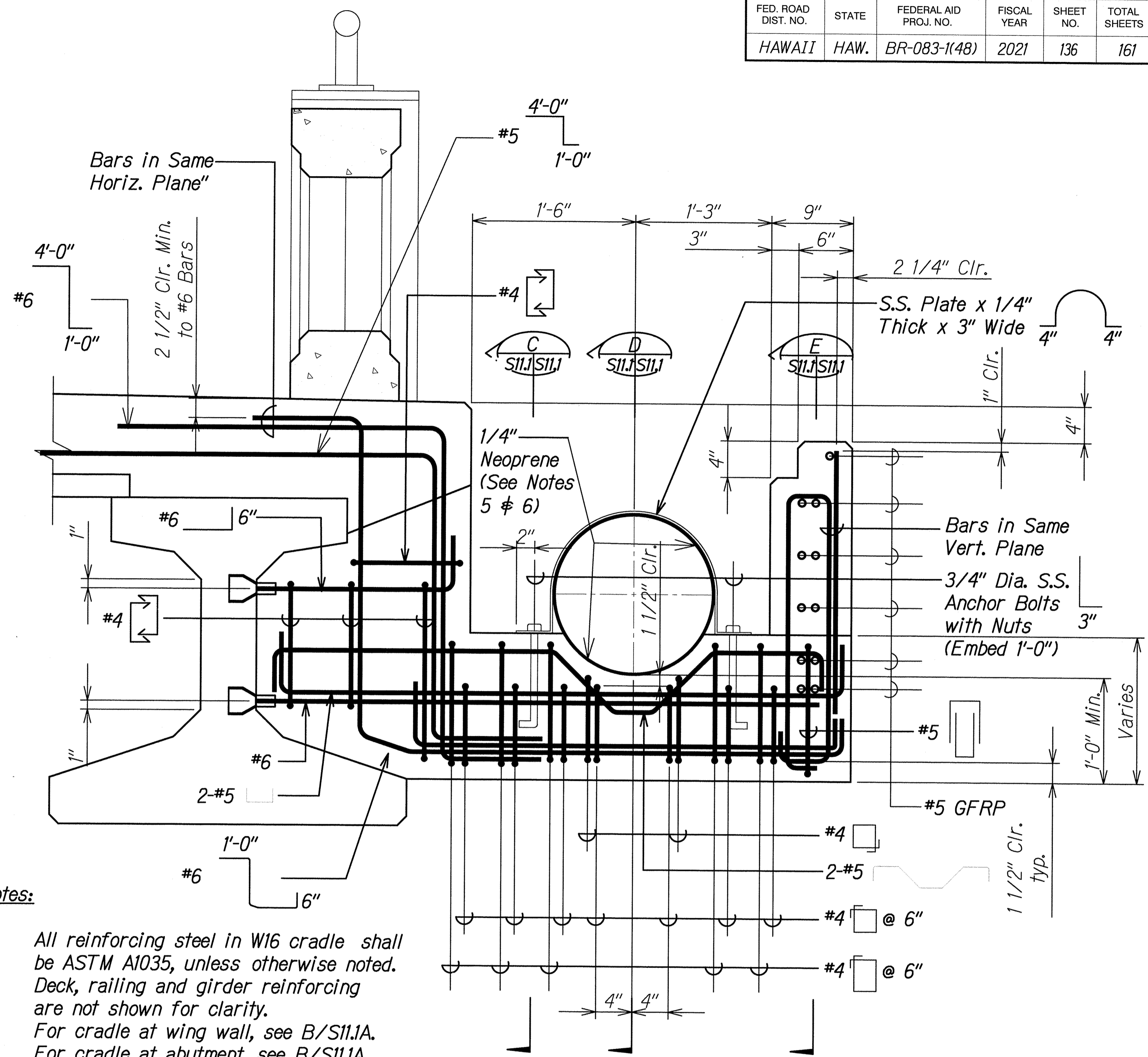
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| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 136 | 161 |



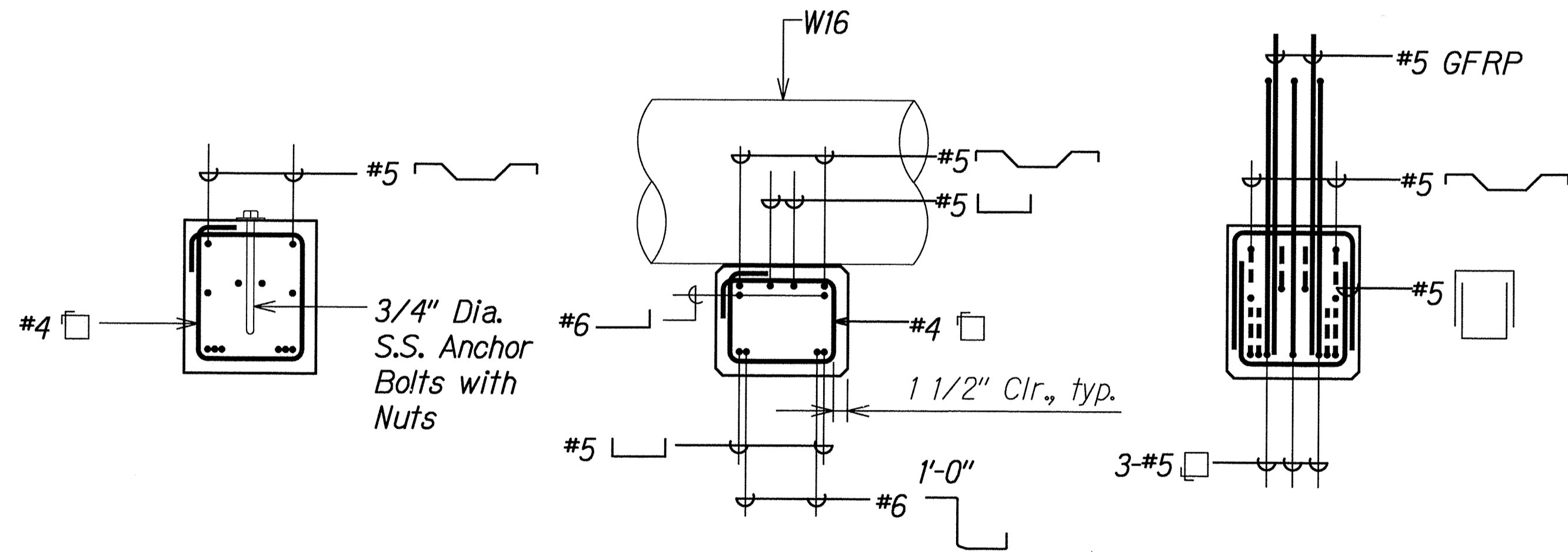
- Notes:**
- Contractor shall submit locations of W16 Cradles. Contractor shall coordinate W16 Cradle locations with precast girder manufacturer, deck reinforcing abutment reinforcing and wing wall reinforcing.
 - Concrete is not Scored within First and Last 2'-0" of Curtain Wall.

CURTAIN WALL ELEVATION
Scale: 3/4" = 1'-0"
A
S11.1 | S11.1



- Notes:**
- All reinforcing steel in W16 cradle shall be ASTM A1035, unless otherwise noted.
 - Deck, railing and girder reinforcing are not shown for clarity.
 - For cradle at wing wall, see B/S11.1A.
 - For cradle at abutment, see B/S11.1A similar.
 - Place 1/4" Neoprene Between W16 and S.S. Plate.
 - Place 1/4" Neoprene Between W16 and Cradle.

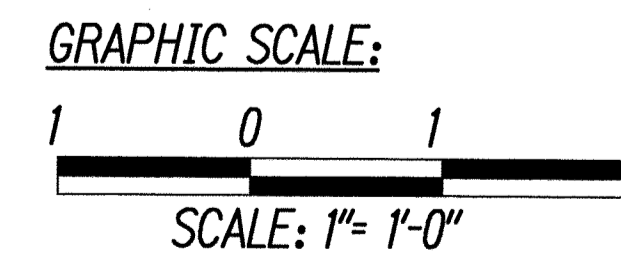
W16 CRADLE SECTION
Scale: 1 1/2" = 1'-0"
B
S11.1 | S11.1



SECTION C
Scale: 1" = 1'-0"
S11.1 | S11.1

SECTION D
Scale: 1" = 1'-0"
S11.1 | S11.1

SECTION E
Scale: 1" = 1'-0"
S11.1 | S11.1



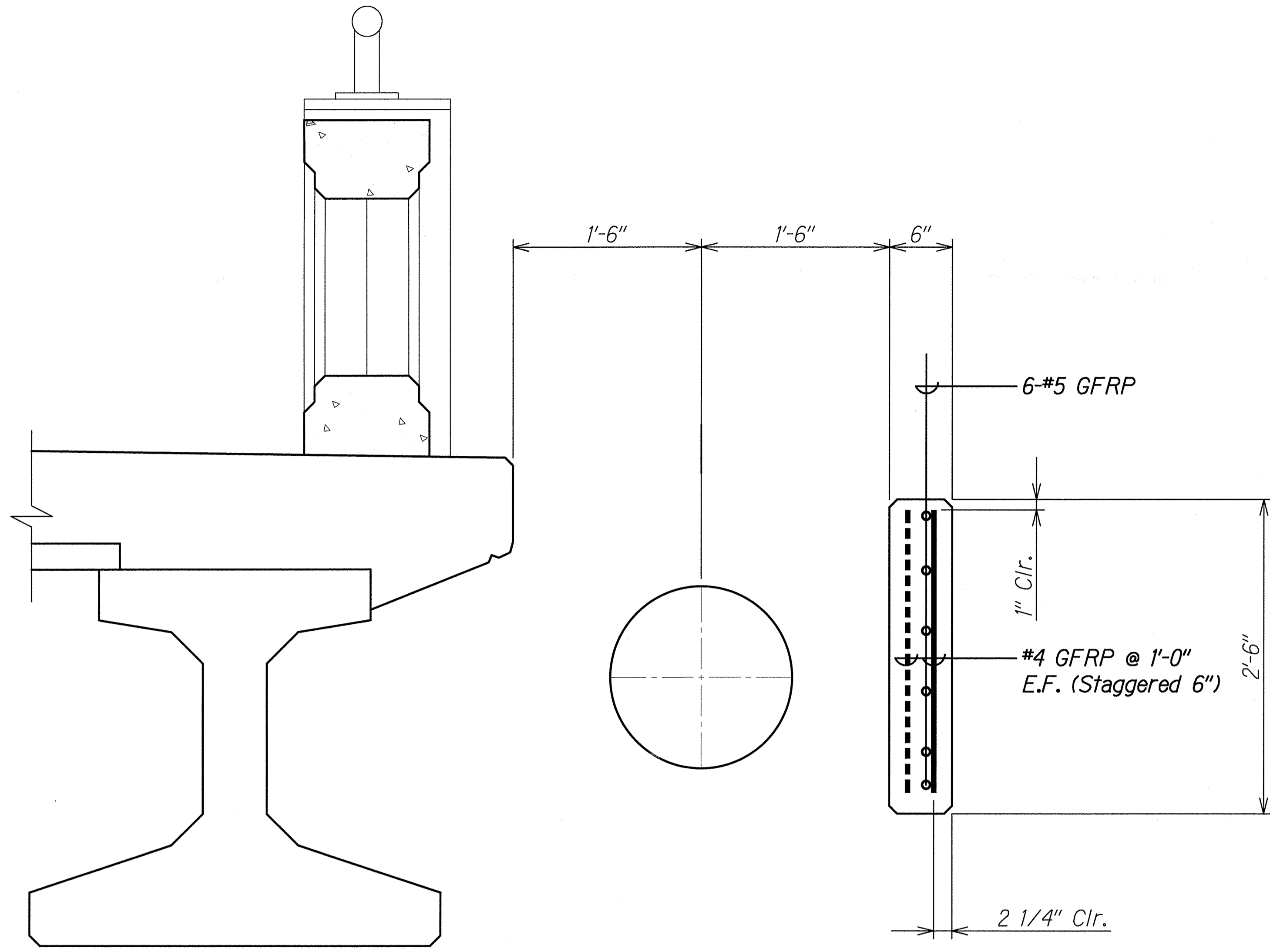
APPROVED: _____ DATE: MAY 24 2021
 Manager and Chief Engineer, BWS
 (for work affecting BWS facilities
 State R/W & BWS easements only)

DENIS K. MITSUNAGA
 LICENSED PROFESSIONAL ENGINEER
 No. 2422-S
 HAWAII, USA
 4/30/22
 SIGNATURE LIC. EXPIRATION
 MITSUNAGA & ASSOCIATES, INC.

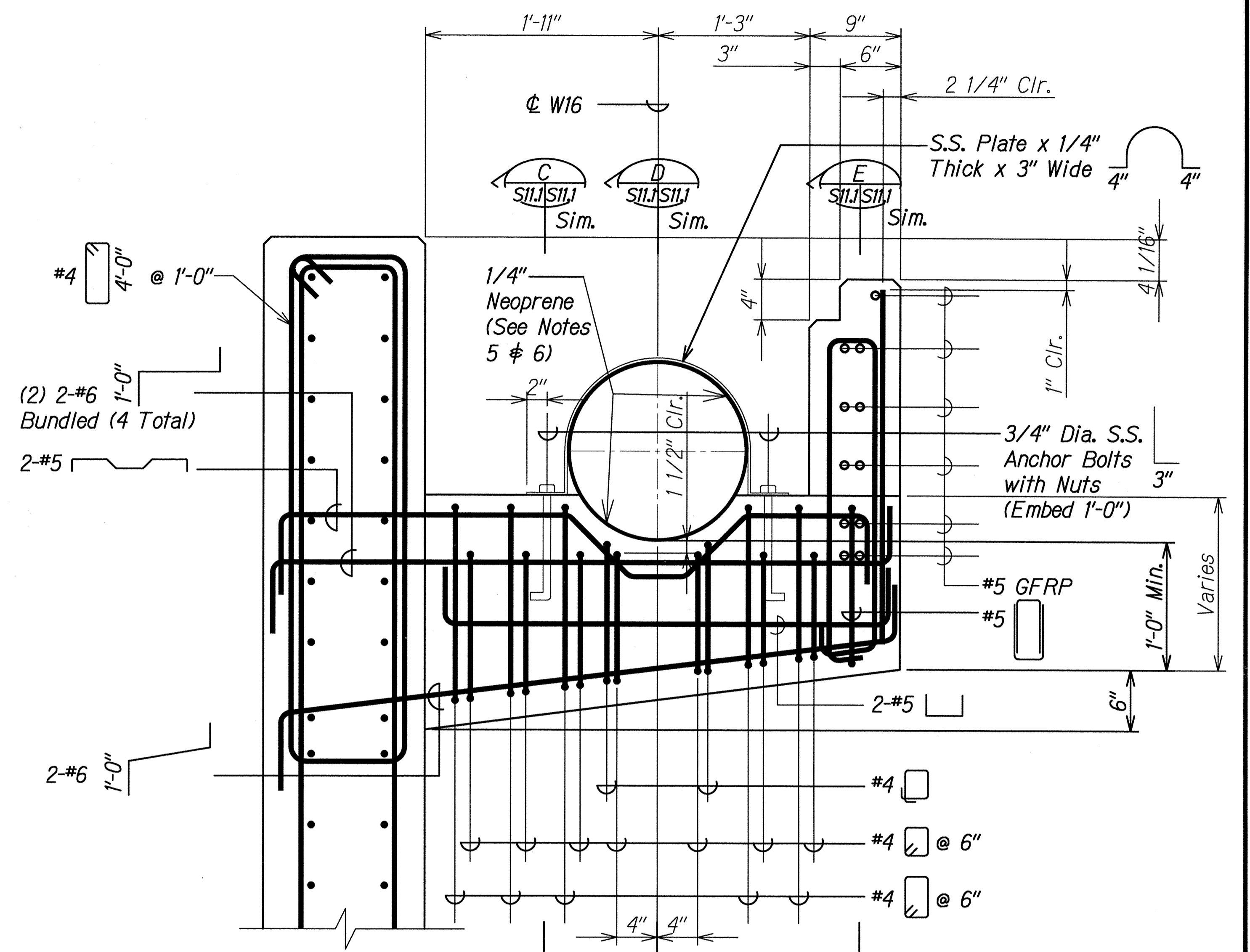
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
W16 CRADLE AND CURTAIN WALL
 KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)
 Scale: As Noted Date: February 2021
 SHEET No. S11.1 OF 5 SHEETS

DATE _____
 SURVEY PLOTTED BY _____
 ORIGINAL PLAN _____
 DRAWN BY _____
 DESIGNED BY _____
 NOTE BOOK _____
 QUANTITIES BY _____
 CHECKED BY _____
 No. _____

| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-----------------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 137 | 161 |



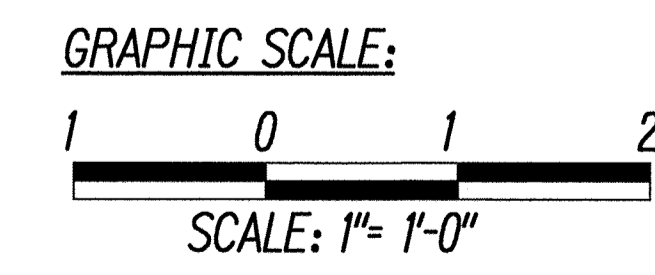
W16 CURTAIN WALL SECTION
 Scale: 1 1/2" = 1'-0"
 A
 S11.1 | S11.1A



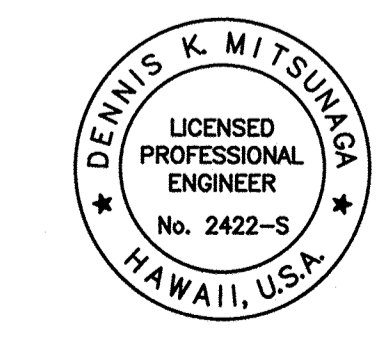
W16 CRADLE AT WING WALL
 Scale: 1 1/2" = 1'-0"
 B
 S11.1A | S11.1A

Notes:

1. All reinforcing steel in W16 cradle shall be ASTM A1035, unless otherwise noted.
2. Deck, railing and girder reinforcing are not shown for clarity.
3. For cradle at wing wall, see B/S11.1A.
4. For cradle at abutment, see B/S11.1A similar.
5. Place 1/4" Neoprene Between W16 and S.S. Plate.
6. Place 1/4" Neoprene Between W16 and Cradle.



APPROVED:
 Manager and Chief Engineer, BWS
 (for work affecting BWS facilities State R/W & BWS easements only)
 DATE: MAY 24 2021



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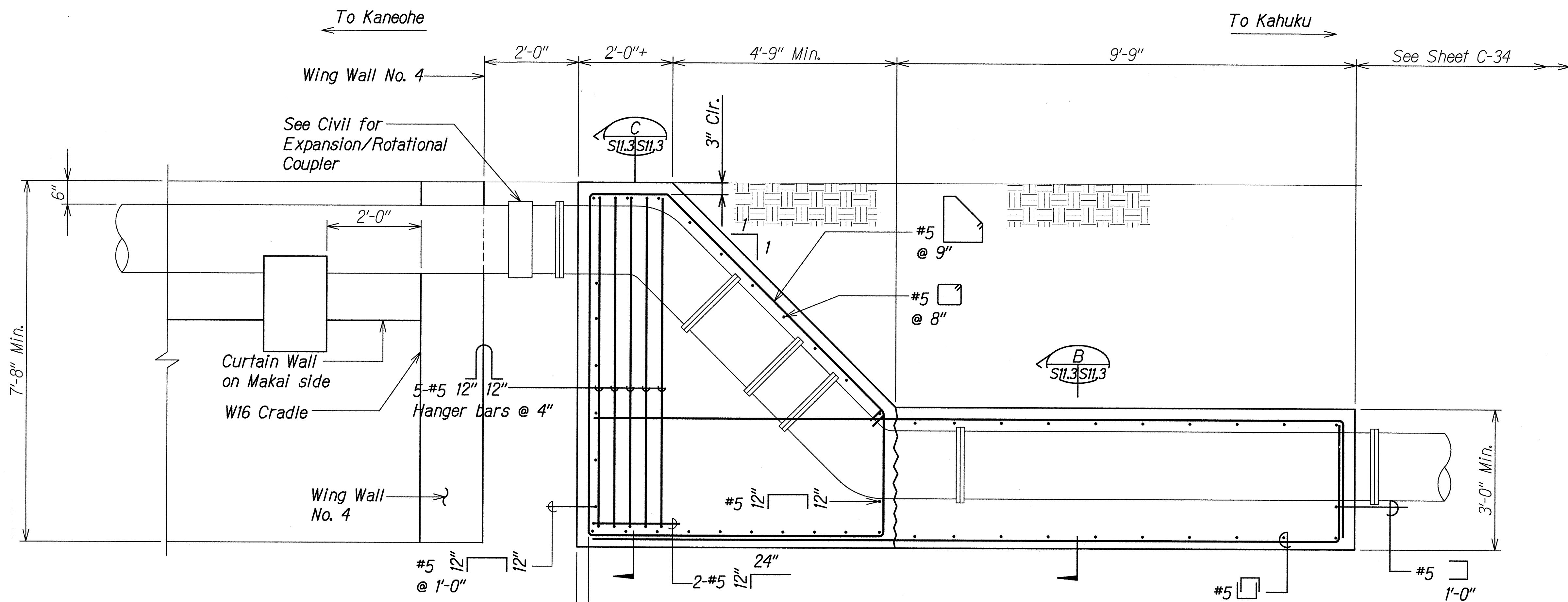
 DATE: 4/30/22
 SIGNATURE: DENNIS K. MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
**W16 CURTAIN WALL SECTION
 AND CRADLE AT WING WALL**
 KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)
 Scale: As Noted Date: February 2021
 SHEET No. S11.1A OF 5 SHEETS

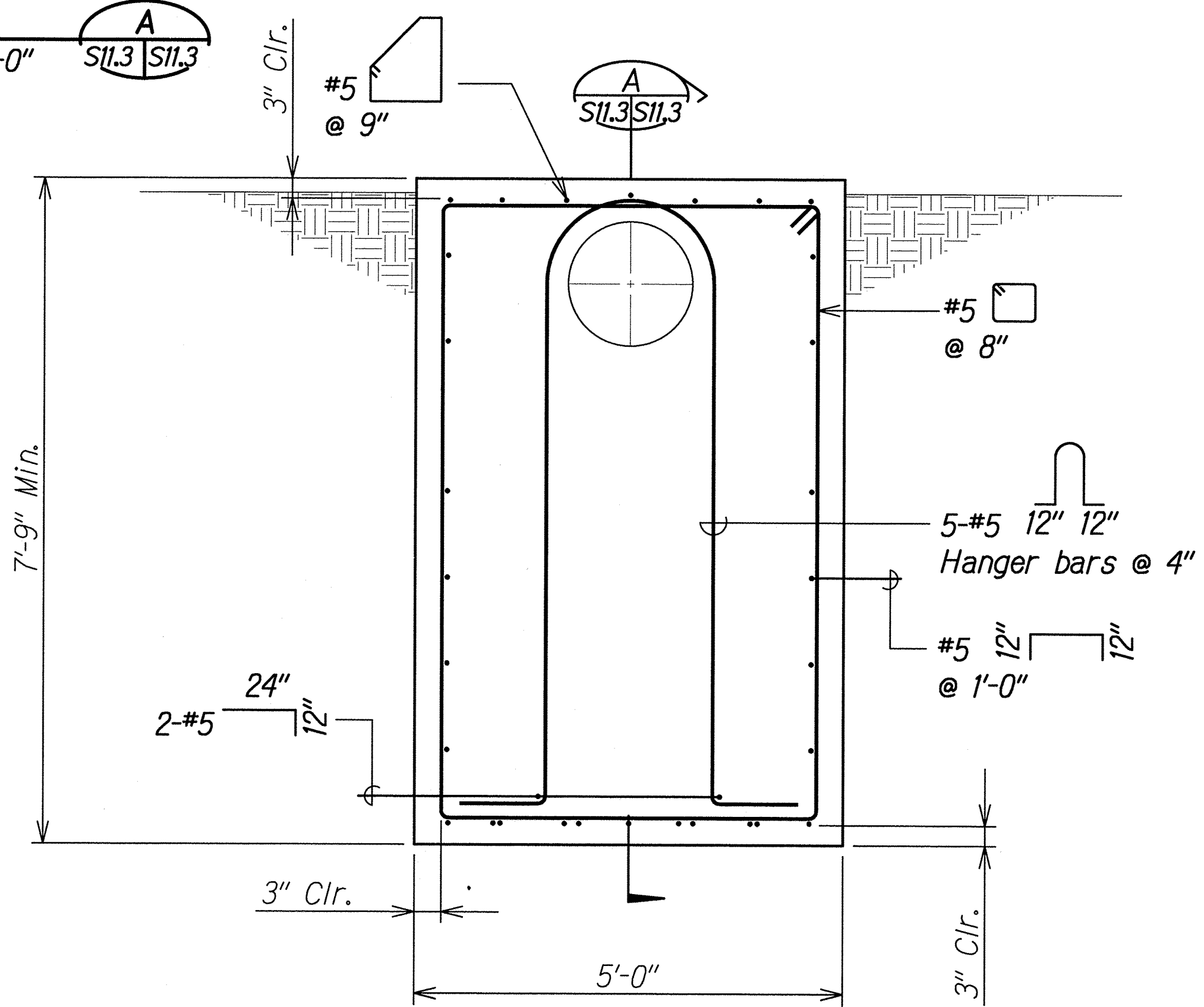
| | |
|-------------------|------|
| SURVEY PLOTTED BY | DATE |
| DRAWN BY | |
| DESIGNED BY | |
| CHECKED BY | |
| ORIGINAL PLAN | |
| NOTE BOOK | |
| No. | |

DRAWING NAME: 1:\PROJECTS\1-ACTIVE FILES\913-01-KAPAPAU BRIDGE\188-REVISED STRUCT\188-051221\KSP-S11.1.DWG PLOT TIME: 05-20-21 11:35 AM

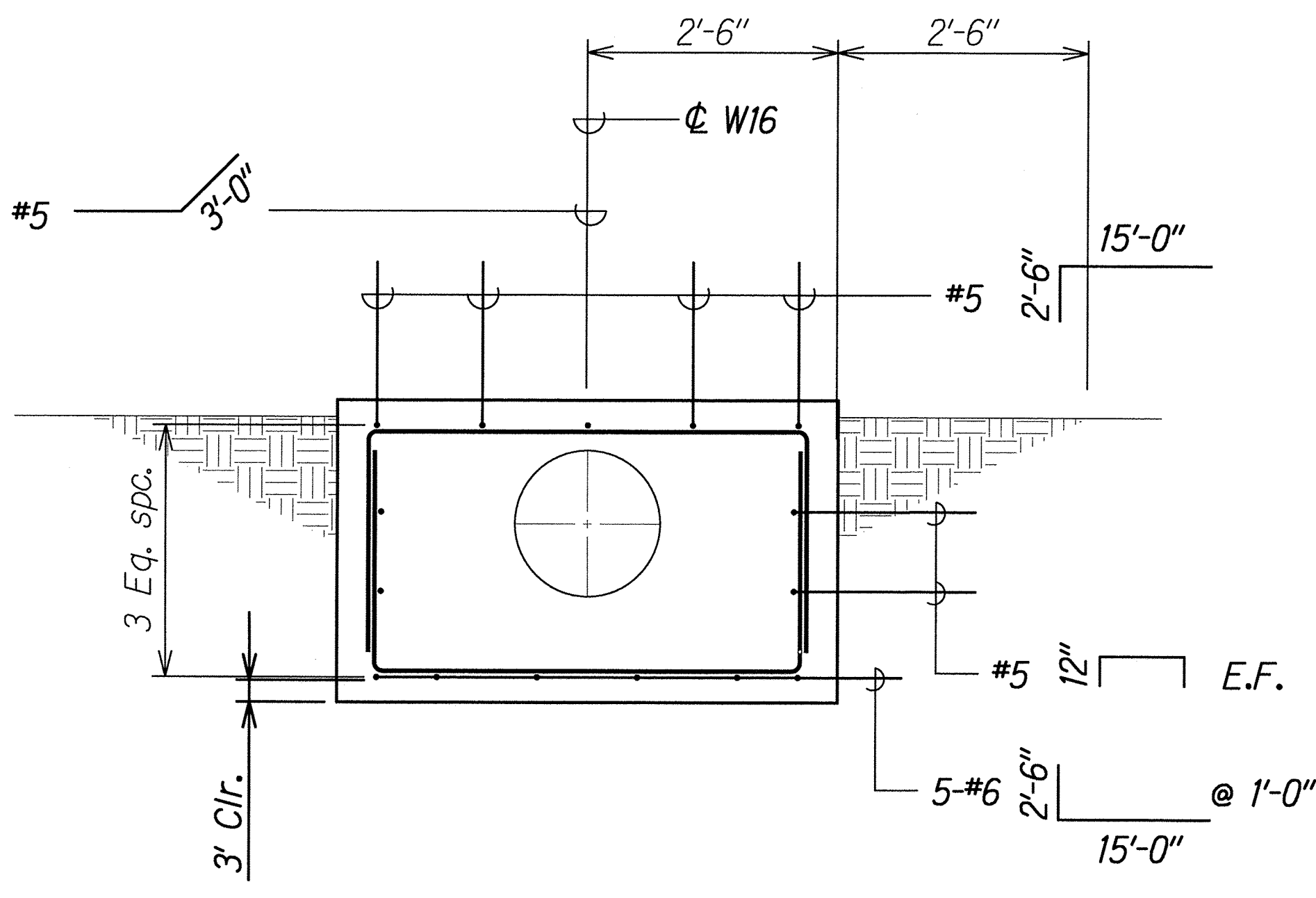
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|---------------------|-------|-----------------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 139 | 161 |



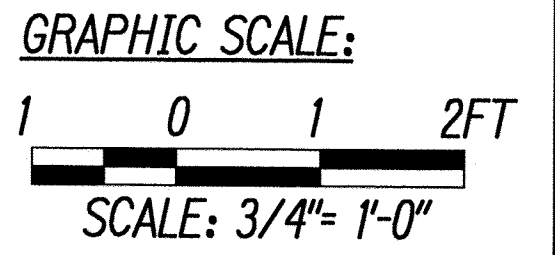
SECTION A
Scale: 3/4" = 1'-0" S11.3 S11.3



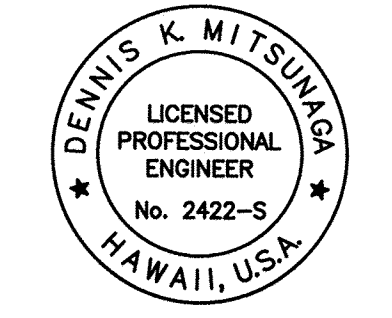
SECTION C
Scale: 3/4" = 1'-0" S11.3 S11.3



SECTION B
Scale: 3/4" = 1'-0" S11.3 S11.3



APPROVED: *[Signature]* MAY 24 2021
 Manager and Chief Engineer, BWS, *[Signature]* DATE
 (for work affecting BWS facilities
 State R/W & BWS easements only)



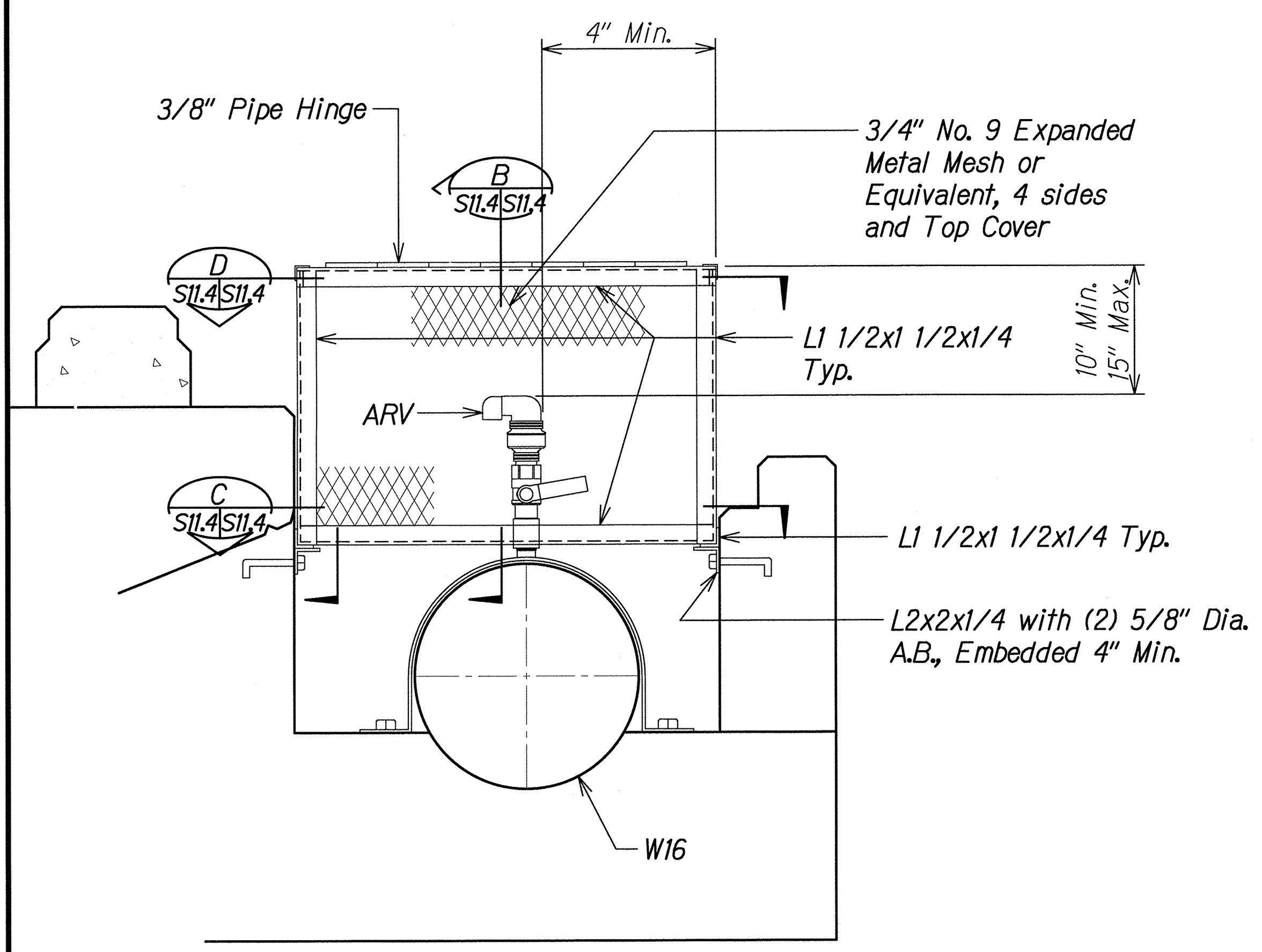
THIS WORK WAS PREPARED BY
 ME OR UNDER MY SUPERVISION
[Signature] 4/30/22
 SIGNATURE LIC. EXPIRATION
 MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
REACTION BLOCK AT
WING WALL NO. 4
 KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)
 Scale: As Noted Date: February 2021

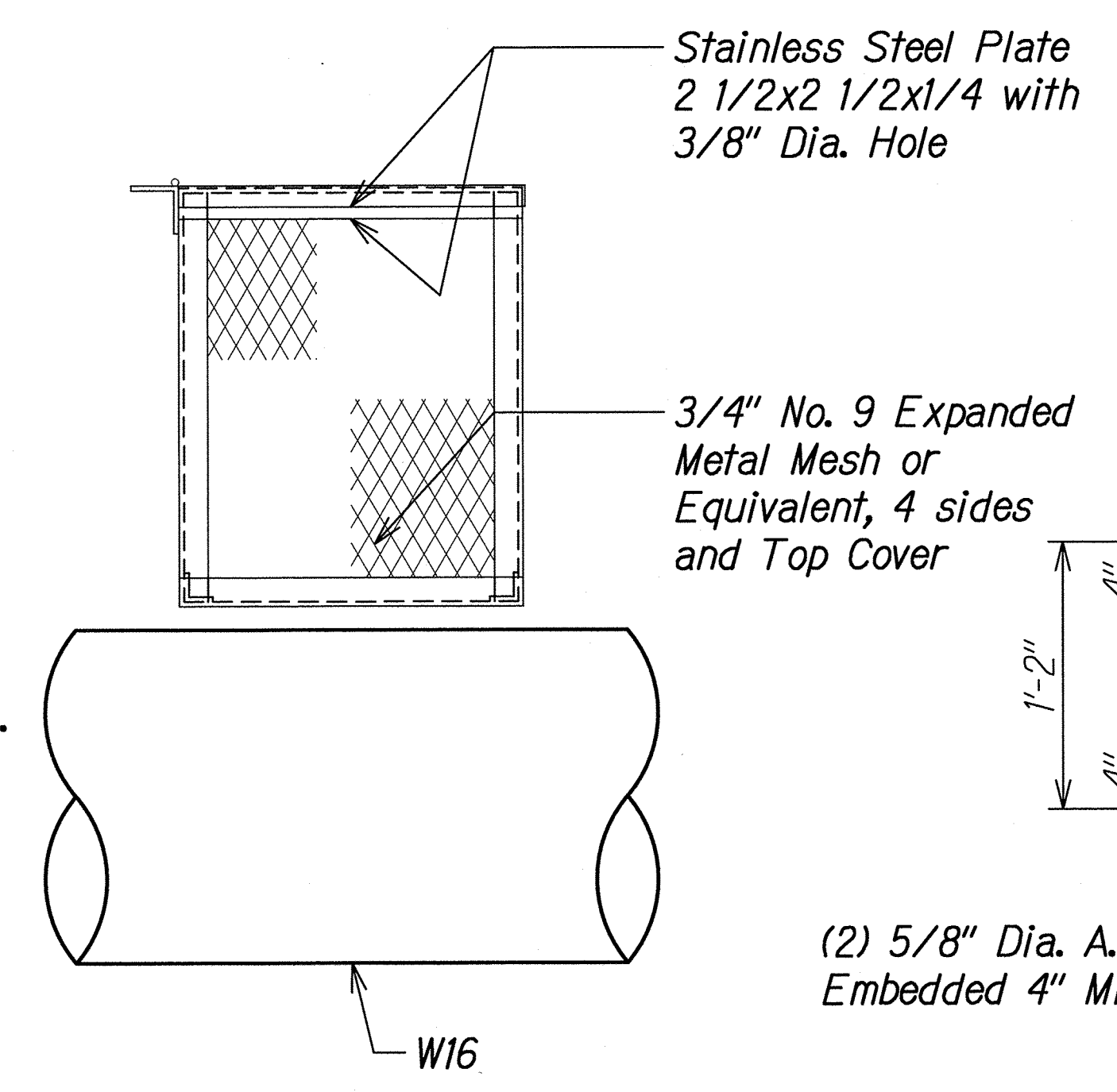
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| ORIGINAL PLAN | DATE |
| SURVEY PLOTTED BY | |
| DRAWN BY | |
| TRACED BY | |
| DESIGNED BY | |
| QUANTITIES BY | |
| CHECKED BY | |
| No. | |

GRAPHIC NAME: I:\PROJECTS\ACTIVE FILES\01-01-2021\BWS\BRIDGE\REPLACEMENT\STRUCTURE\BRIDGE\SECTION\SECTION A11.3.DWG PLOT DATE: 05-13-21 8:59 AM

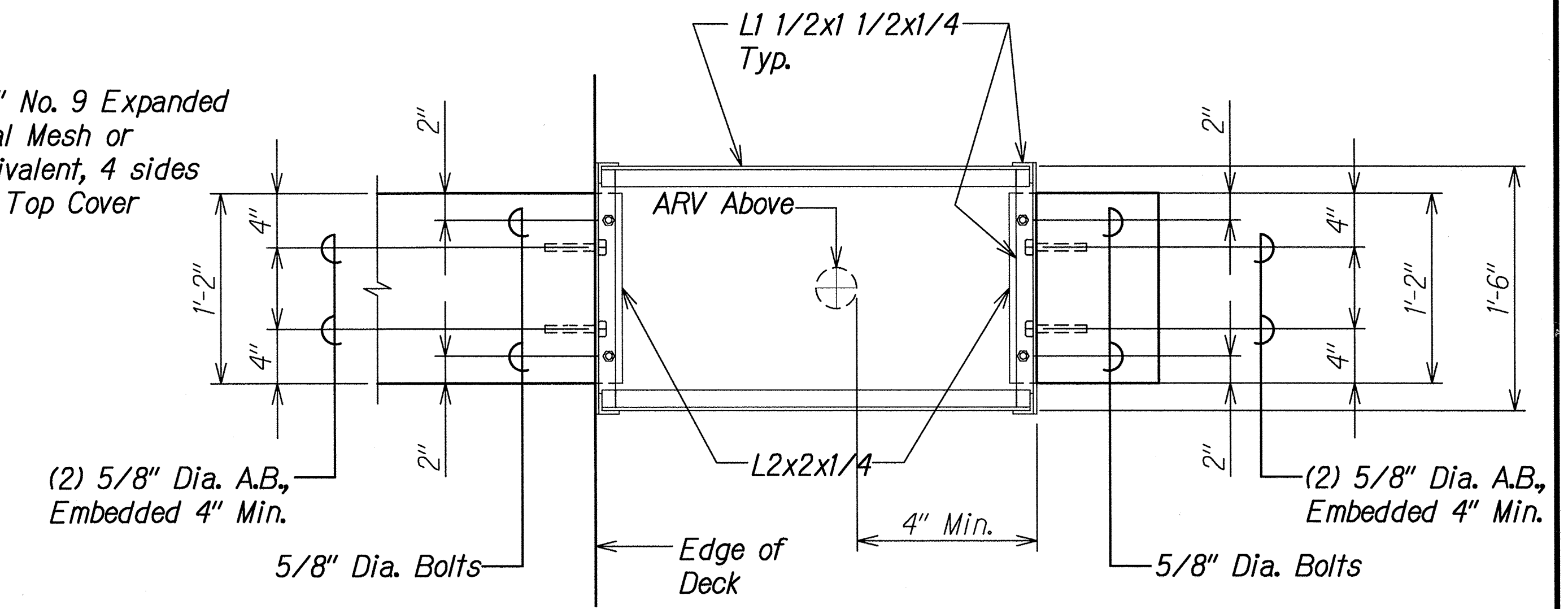
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|---------------------|-------|-----------------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 140 | 161 |



SECTION A
Scale: 1 1/2" = 1'-0" S11.4 S11.4



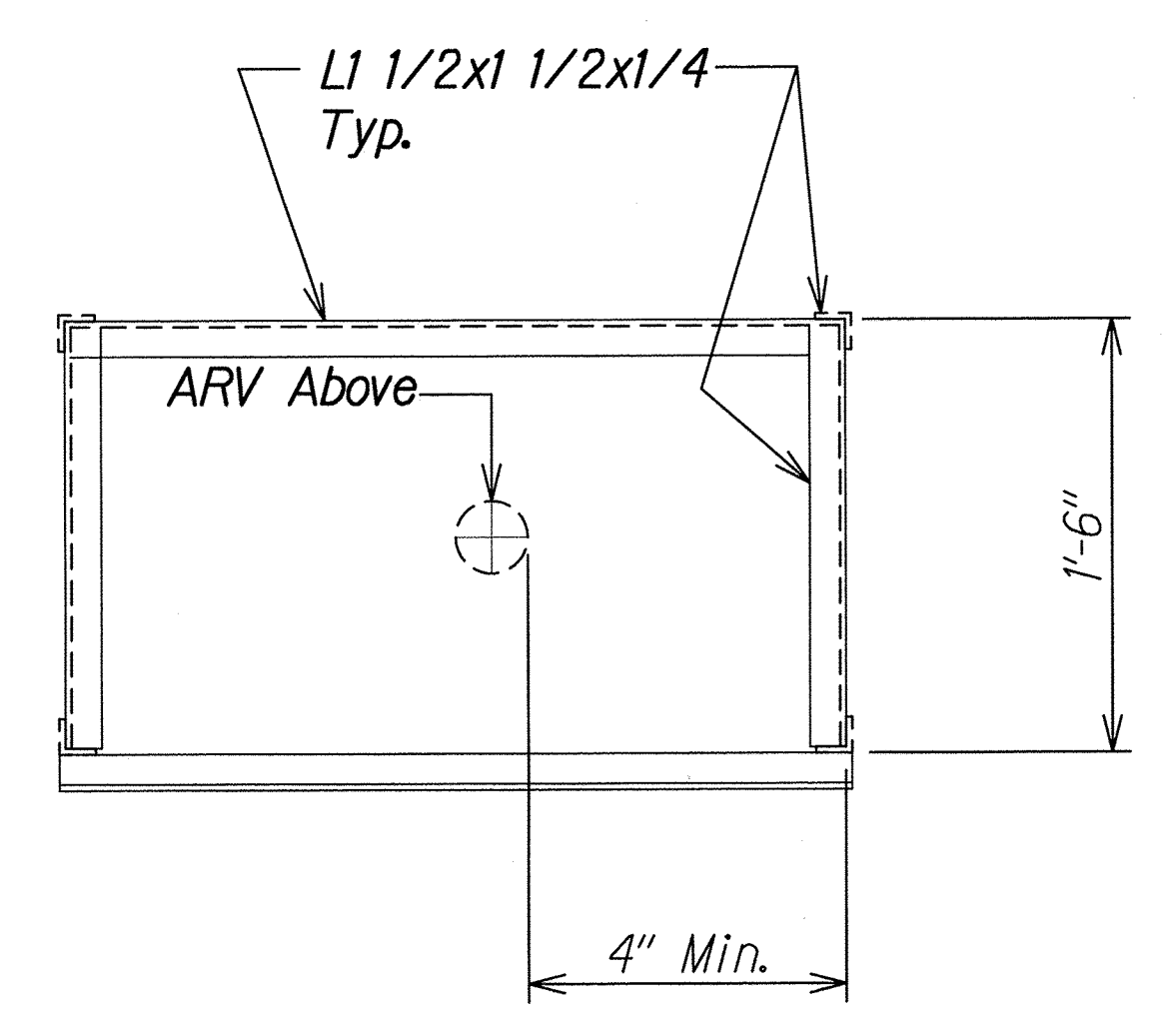
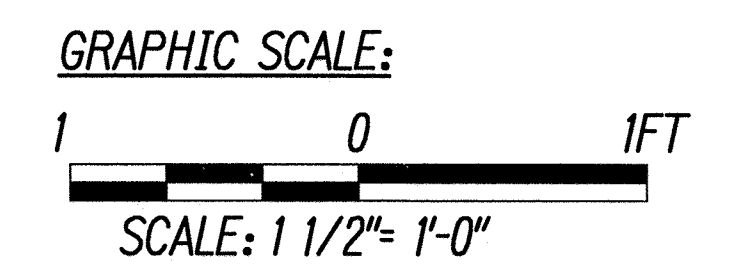
SECTION B
Scale: 1 1/2" = 1'-0" S11.4 S11.4



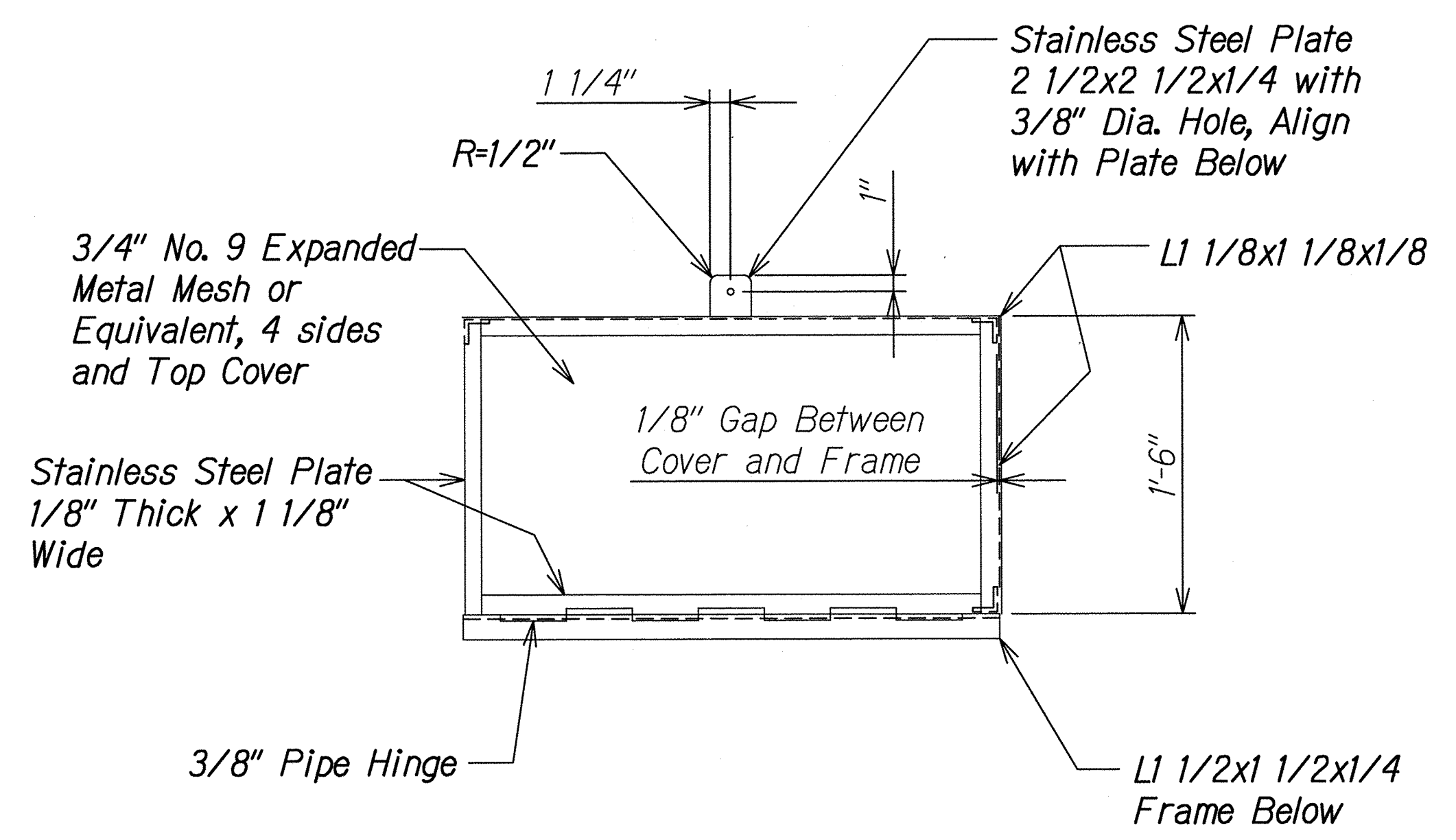
SECTION C
Scale: 1 1/2" = 1'-0" S11.4 S11.4

Notes:

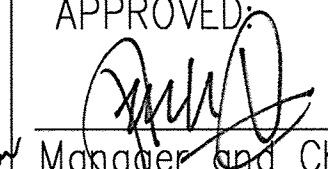
1. All angle connections shall be $\frac{3}{16}$ " fillet welds unless noted.
2. Expanded metal mesh shall be welded to inside edges of angles.
3. Stainless steel pin thru pipe hinge shall be inserted and welded to exterior 2" pipes.
4. All pipe hinges, angles and expanded metal mesh shall be stainless steel.
5. Unless otherwise noted all anchor bolts shall be a minimum of 4" from edge of existing concrete.

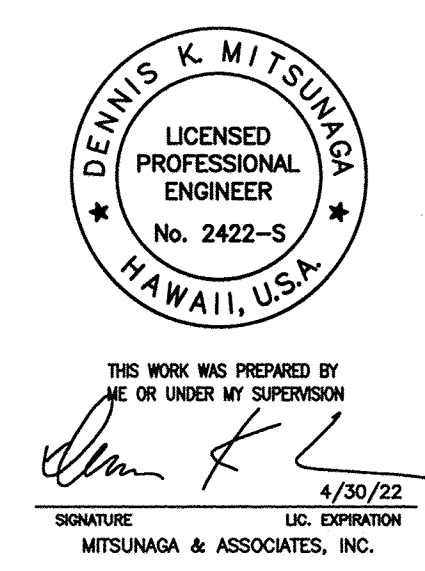


SECTION D
Scale: 1 1/2" = 1'-0" S11.4 S11.4



SECTION E
Scale: 1 1/2" = 1'-0" S11.4 S11.4

APPROVED:  DATE: MAY 24 2021
 Manager and Chief Engineer, BWS (for work affecting BWS facilities State R/W & BWS easements only)



STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

ARV ENCLOSURE DETAILS

KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)

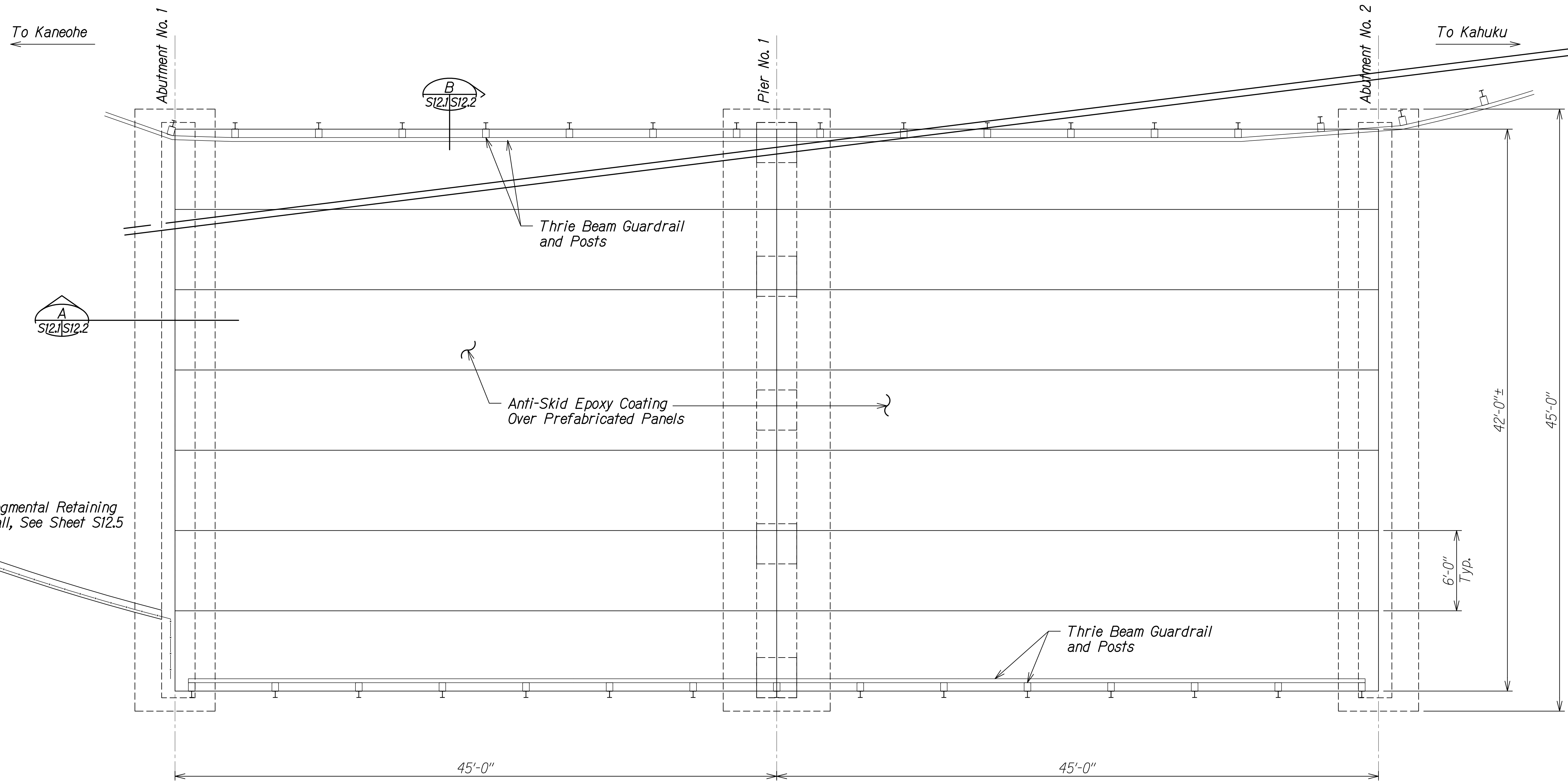
Scale: As Noted Date: February 2021

SHEET No. S11.4 OF 5 SHEETS

| | |
|-------------------|------|
| SURVEY PLOTTED BY | DATE |
| DRAWN BY | |
| TRACED BY | |
| QUANTITIES BY | |
| CHECKED BY | |
| ORIGINAL PLAN | No. |

DRAWING NAME: E:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE \$\$\$_REVISED_STRUCT_\$.051221\KSR-3110.DWG PLOT TIME: 05-13-21 8:53 AM

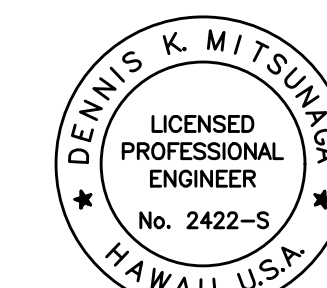
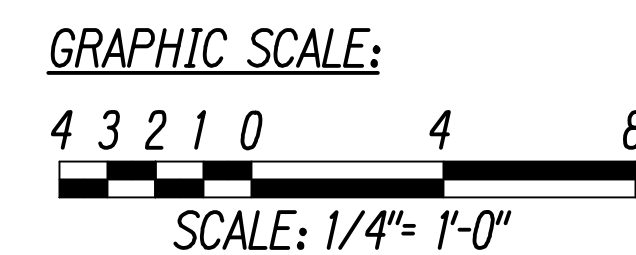
| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-----------------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 141 | 161 |



NOTES:

1. See Section 512 for submittals to be stamped and sealed by Hawaii licensed professional geotechnical and structural Engineers.
2. All drawings and details for the prefabricated steel beam bridge and segmental retaining wall shown on sheets S12.1 to S12.5 are schematic only and are shown for bidding purposes only.

DETOUR ROAD TEMPORARY BRIDGE LAYOUT PLAN
 Scale: 1/4" = 1'-0" A
S12.1 S12.1



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
 SIGNATURE: *[Signature]* LIC. EXPIRATION: 4/30/22
 MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

**PREFABRICATED STEEL
 BEAM BRIDGE**

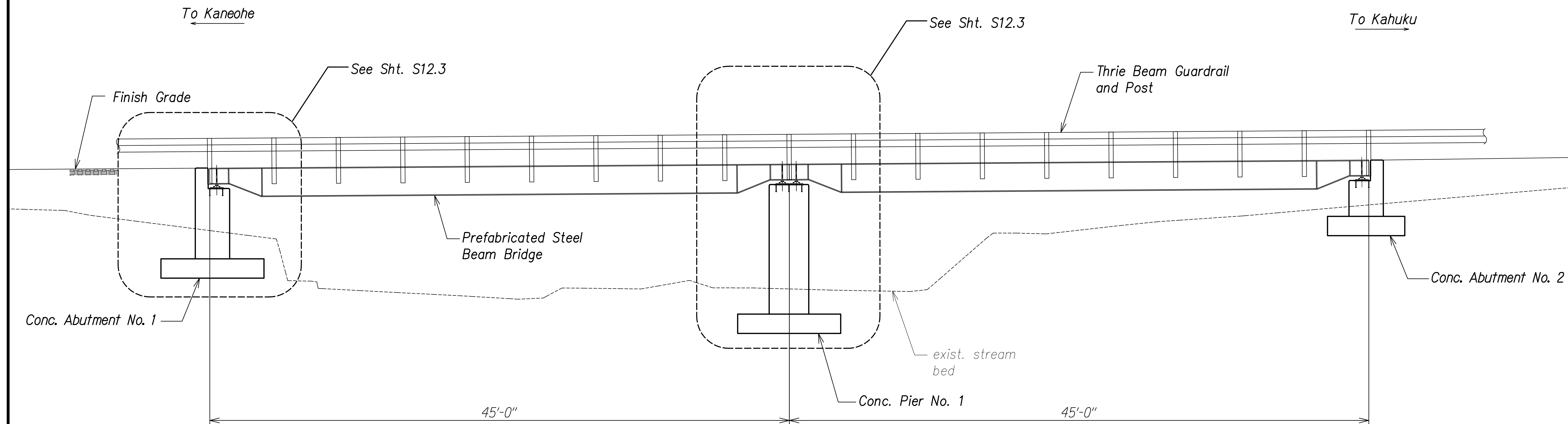
**KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)**

Scale: As Noted Date: February 2021
 SHEET No. S121 OF 5 SHEETS

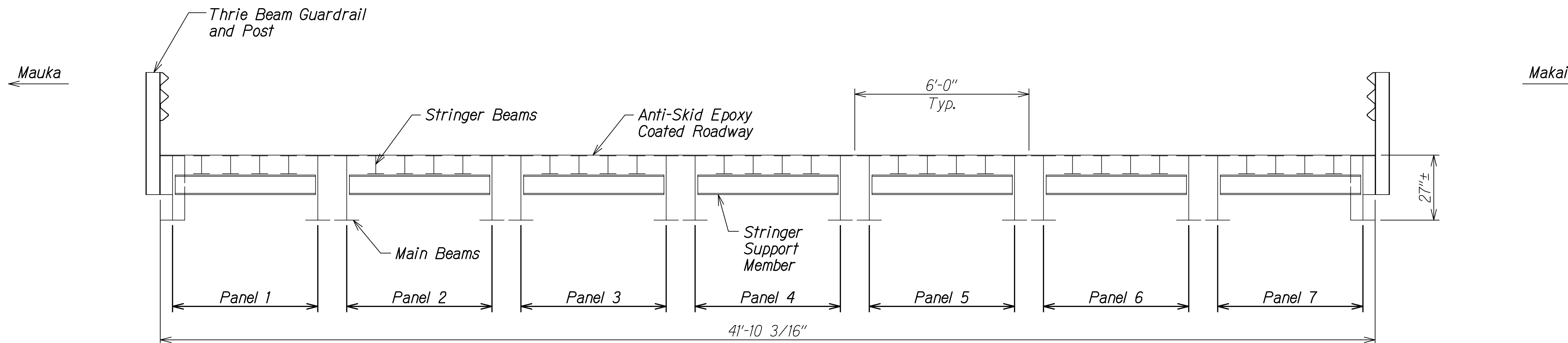
| | |
|-----------------------|------------------|
| ORIGINAL PLAN | DATE |
| NO. _____ | _____ |
| DESIGNED BY _____ | CHECKED BY _____ |
| QUANTITIES BY _____ | |
| TRACED BY _____ | |
| DATE PLOTTED BY _____ | |

DRAWING NAME: I:\PROJECTS\ACTIVE FILES\13-01-KAIPAPAU BRIDGE\REVISED-STRUCT\13-051221\KSB-S1201.DWG PLOT TIME: 06-09-21, 3:43 PM

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|---------------------|-------|-----------------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 142 | 161 |



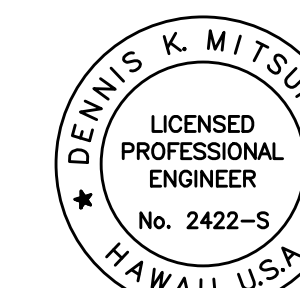
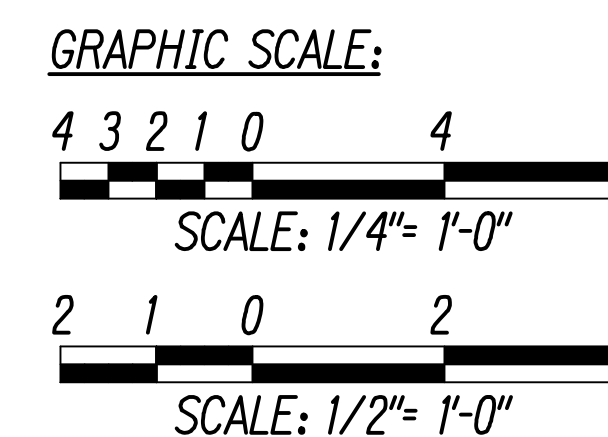
LONGITUDINAL ELEVATION A
 Scale: 1/4" = 1'-0" S12.1 S12.2



TYPICAL SECTION B
 Scale: 1/2" = 1'-0" S12.1 S12.2

NOTES:

1. See Section 512 for submittals to be stamped and sealed by Hawaii licensed professional geotechnical and structural Engineers.
2. All drawings and details for the prefabricated steel beam bridge and segmental retaining wall shown on sheets S12.1 to S12.5 are schematic only and are shown for bidding purposes only.



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 MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

**PREFABRICATED STEEL BEAM BRIDGE
 ELEVATION AND TYPICAL SECTION**

**KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)**

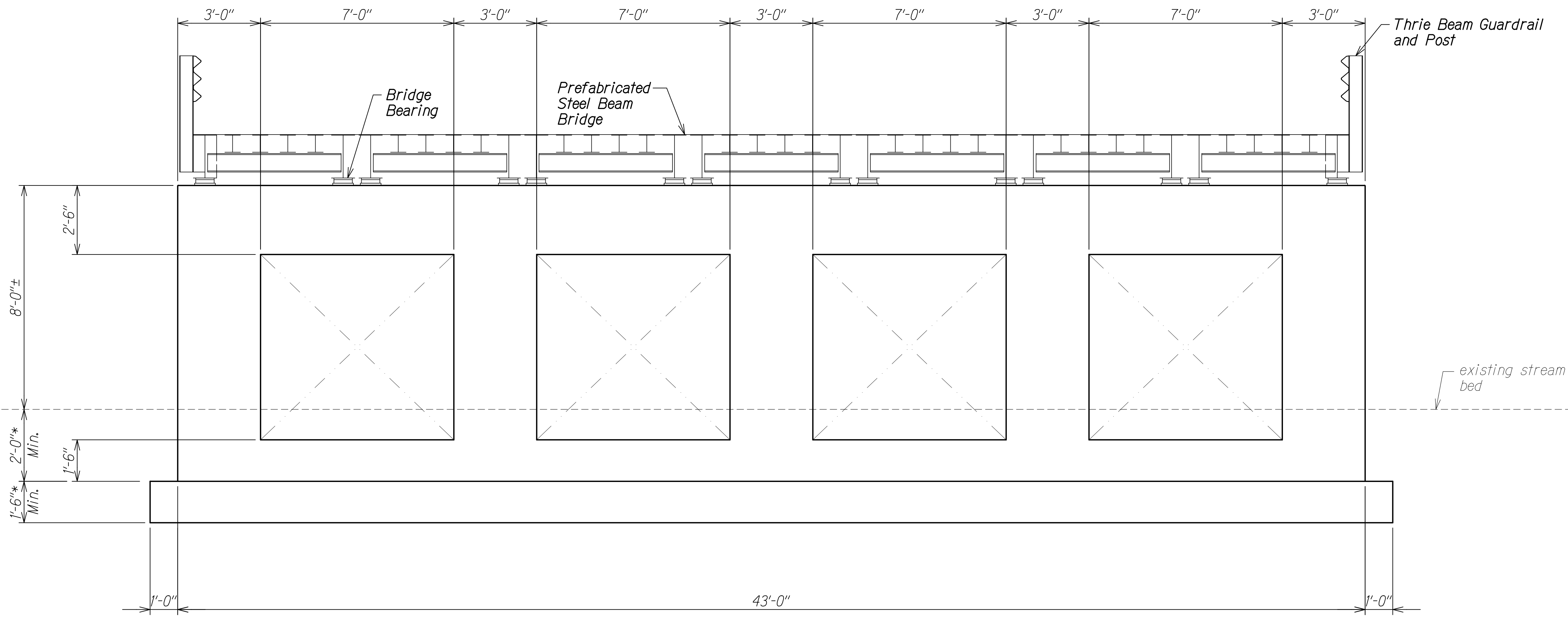
Scale: As Noted Date: February 2021

SHEET No. S12.2 OF 5 SHEETS

| | |
|---------------|------|
| ORIGINAL PLAN | DATE |
| DESIGNED BY | |
| CHECKED BY | |
| NO. | |

DRAWING NAME: I:\PROJECTS\ACTIVE FILES\13-01_KAIPAPAU BRIDGE\REVISED_STRUCTURE\13-051221\KSB-S1202.DWG PLOT TIME: 06-09-21, 3:44 PM

| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-----------------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 143 | 161 |



* Submit calculations and details to show that the foundation will not be adversely affected by scouring.

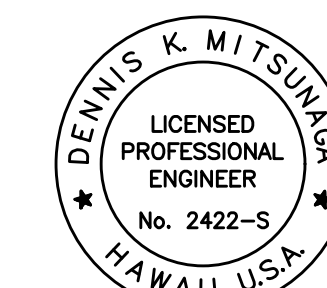
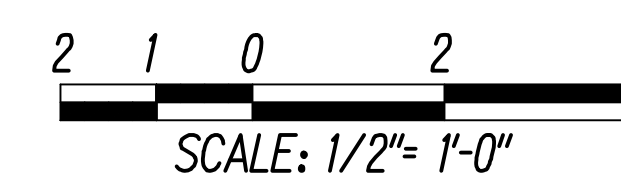
PIER NO. 1 ELEVATION A
 Scale: 1/2" = 1'-0" S12.4 | S12.3

| | |
|---------------|---------------|
| ORIGINAL PLAN | DATE |
| DESIGNED BY | DESIGNED BY |
| QUANTITIES BY | QUANTITIES BY |
| CHECKED BY | CHECKED BY |
| No. | No. |

NOTES:

1. See Section 512 for submittals to be stamped and sealed by Hawaii licensed professional geotechnical and structural Engineers.
2. All drawings and details for the prefabricated steel beam bridge and segmental retaining wall shown on sheets S12.1 to S12.5 are schematic only and are shown for bidding purposes only.

GRAPHIC SCALE:



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 SIGNATURE: *[Signature]* LIC. EXPIRATION: 4/30/22
 MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

PREFABRICATED STEEL BEAM BRIDGE
FOUNDATION ELEVATION

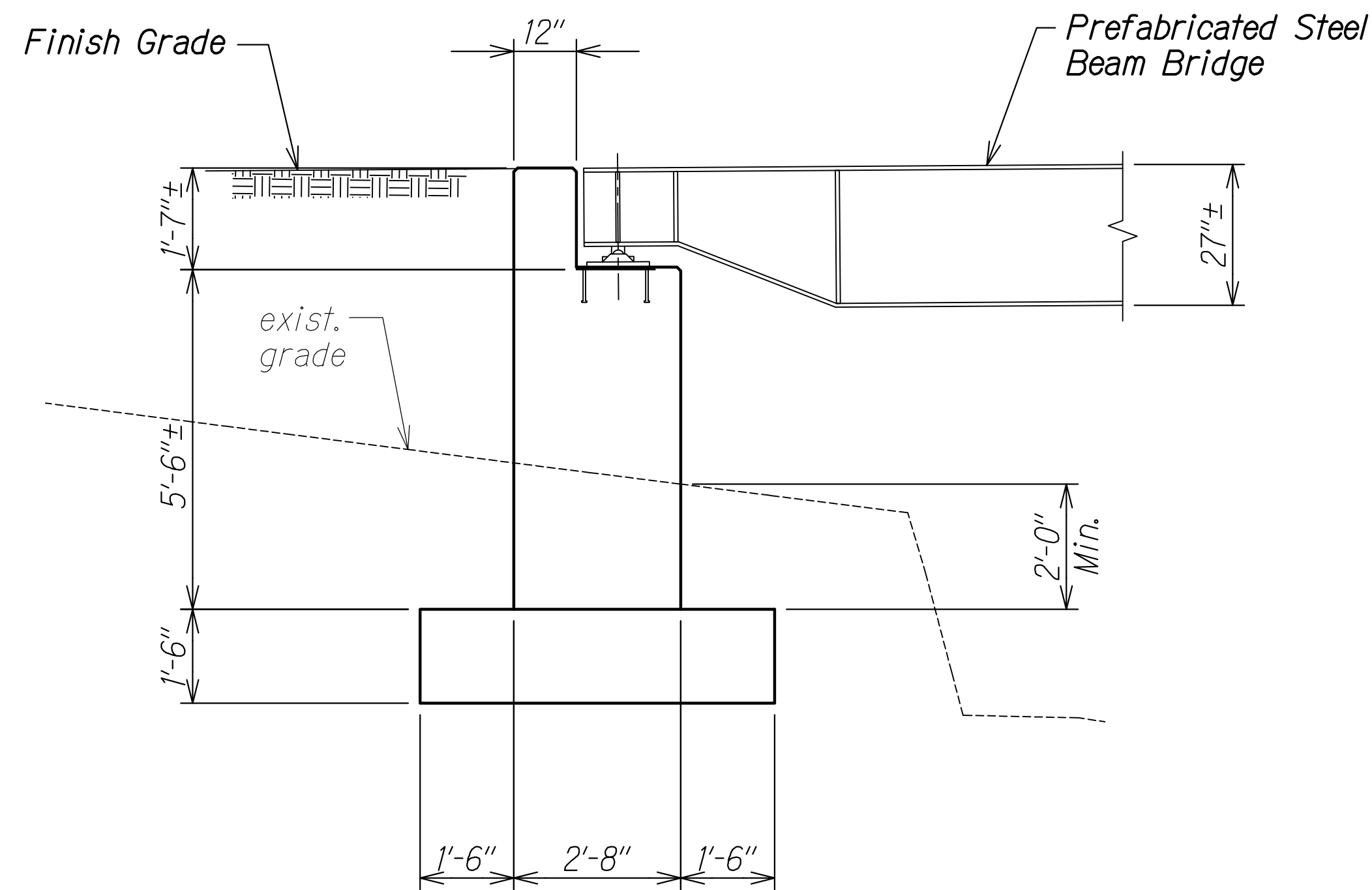
KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)

Scale: As Noted Date: February 2021

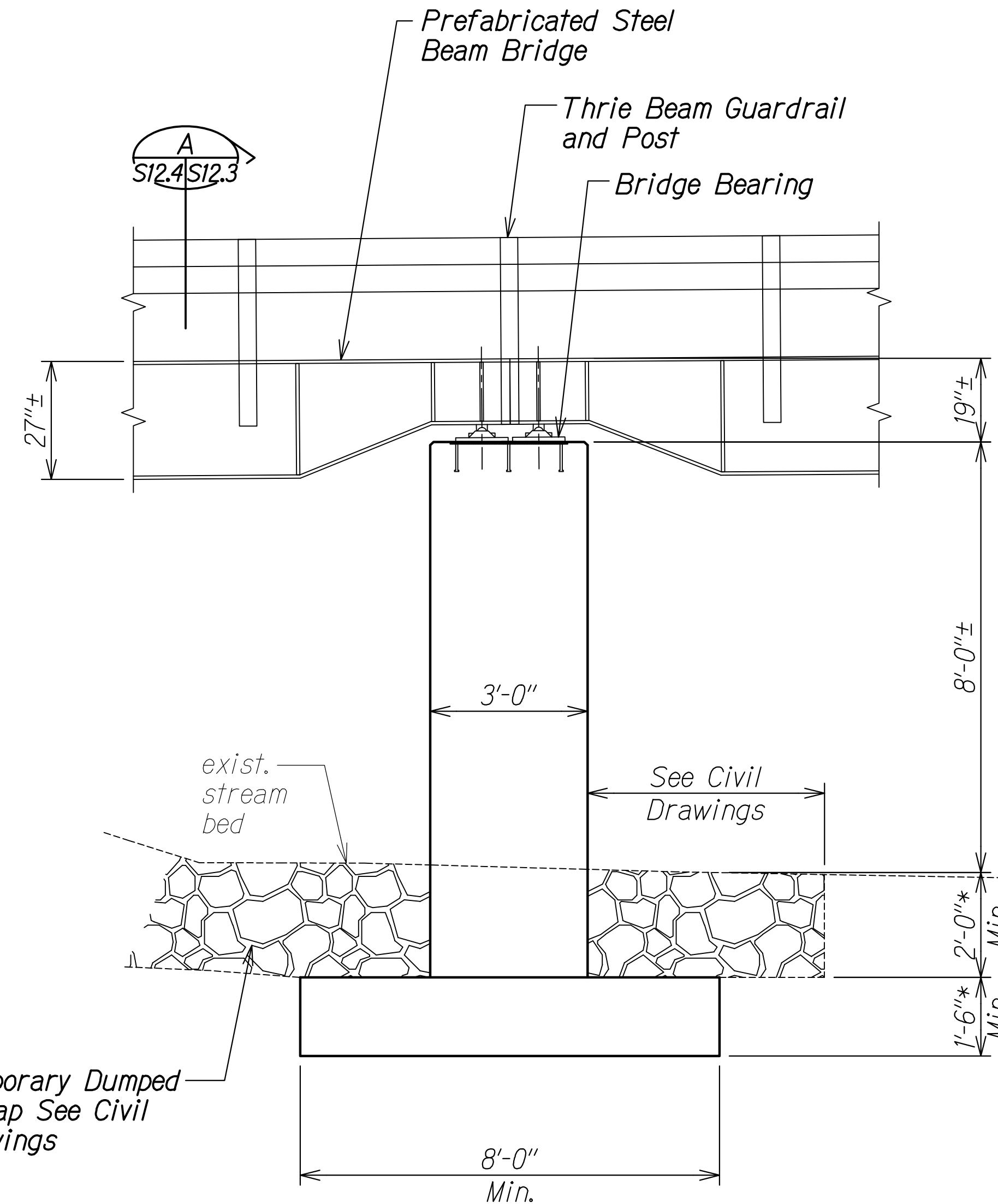
SHEET No. S12.3 OF 5 SHEETS

DRAWING NAME: I:\PROJECTS\ACTIVE FILES\13-01-KAIPAPAU BRIDGE\REVISED_STRUCTURE\13-051221\KSB-S1202.DWG PLOT TIME: 06-08-21, 3:44 PM

| FED. ROAD DIST. NO. | STATE | FEDERAL AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-----------------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 144 | 161 |



ABUTMENT SECTION A
 Scale: 1/2" = 1'-0" S12.4 S12.4



PIER NO. 1 SECTION B
 Scale: 1/2" = 1'-0" S12.4 S12.4

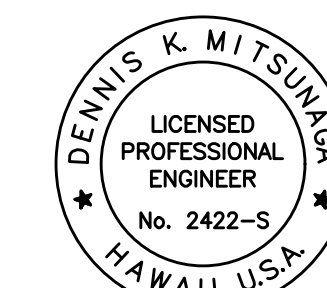
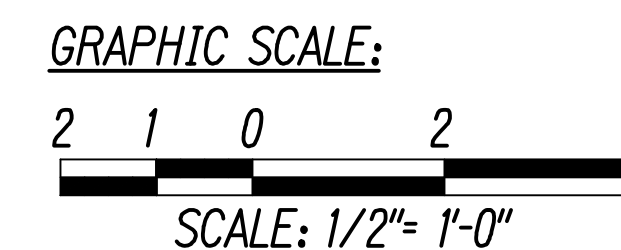
* Submit calculations and details to show that the foundation will not be adversely affected by scouring.

NOTES:

1. See Section 512 for submittals to be stamped and sealed by Hawaii licensed professional geotechnical and structural Engineers.
2. All drawings and details for the prefabricated steel beam bridge and segmental retaining wall shown on sheets S12.1 to S12.5 are schematic only and are shown for bidding purposes only.
3. Should loose/soft subsoils be encountered at the footing level, the loose/soft materials shall be over excavated a minimum of 24 inches and replaced with stabilization layer consisting of no. 2 coarse rock wrapped with a filter fabric (Mirafi 180N or equal).

| | |
|---------------|------|
| ORIGINAL PLAN | DATE |
| DESIGNED BY | |
| CHECKED BY | |
| NO. | |

DRAWING NAME: I:\PROJECTS\ACTIVE FILES\13-01_KAIPAPAU BRIDGE\REVISED_STRUCTURE\S1202.DWG PLOT TIME: 06-09-21, 3:45 PM



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 SIGNATURE: *[Signature]* LIC. EXPIRATION: 4/30/22
 MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

PREFABRICATED STEEL BEAM BRIDGE

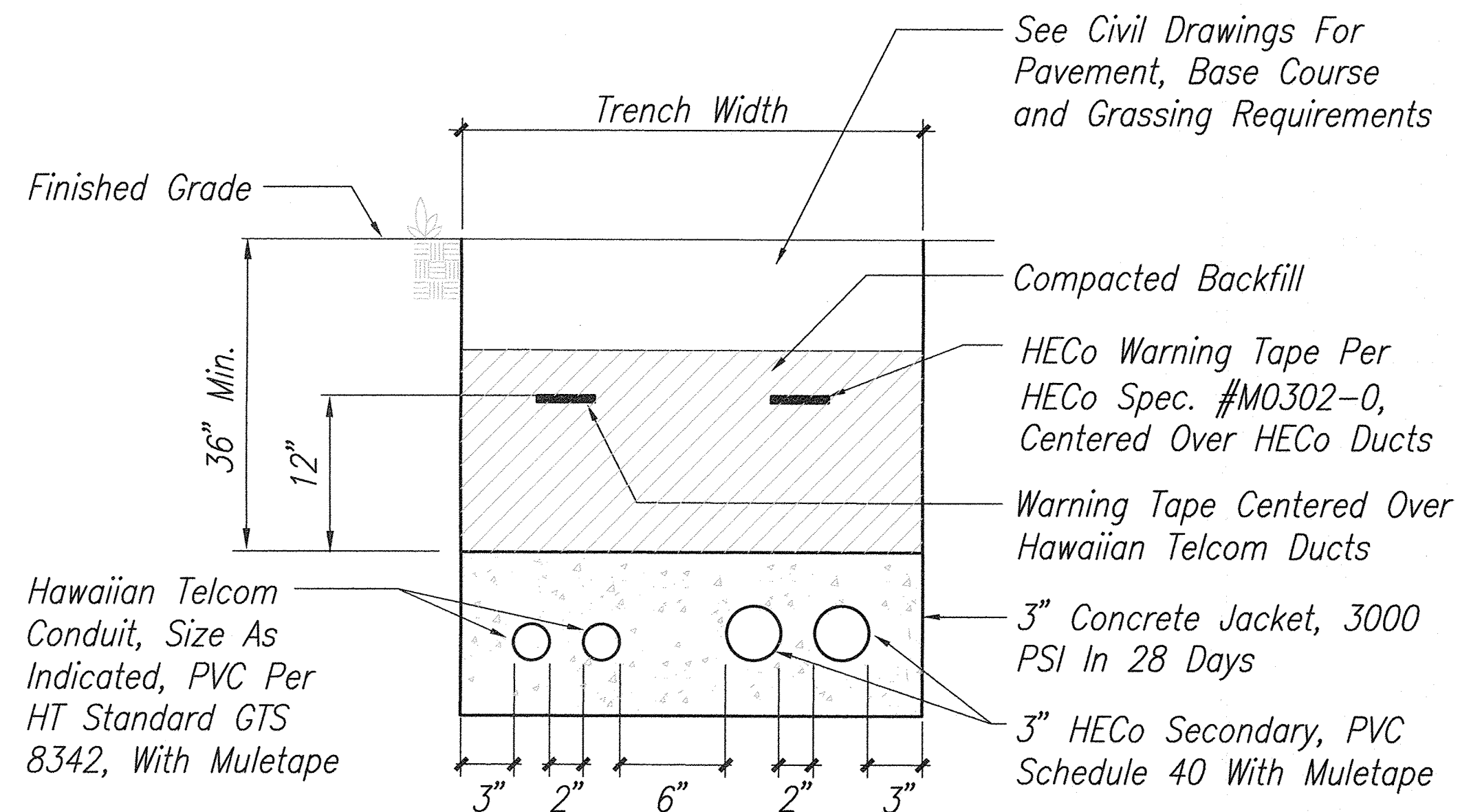
SECTIONS

KAMEHAMEHA HIGHWAY
 Kaipapau Stream Bridge Replacement
 Federal Aid Proj. No. BR-083-1(48)

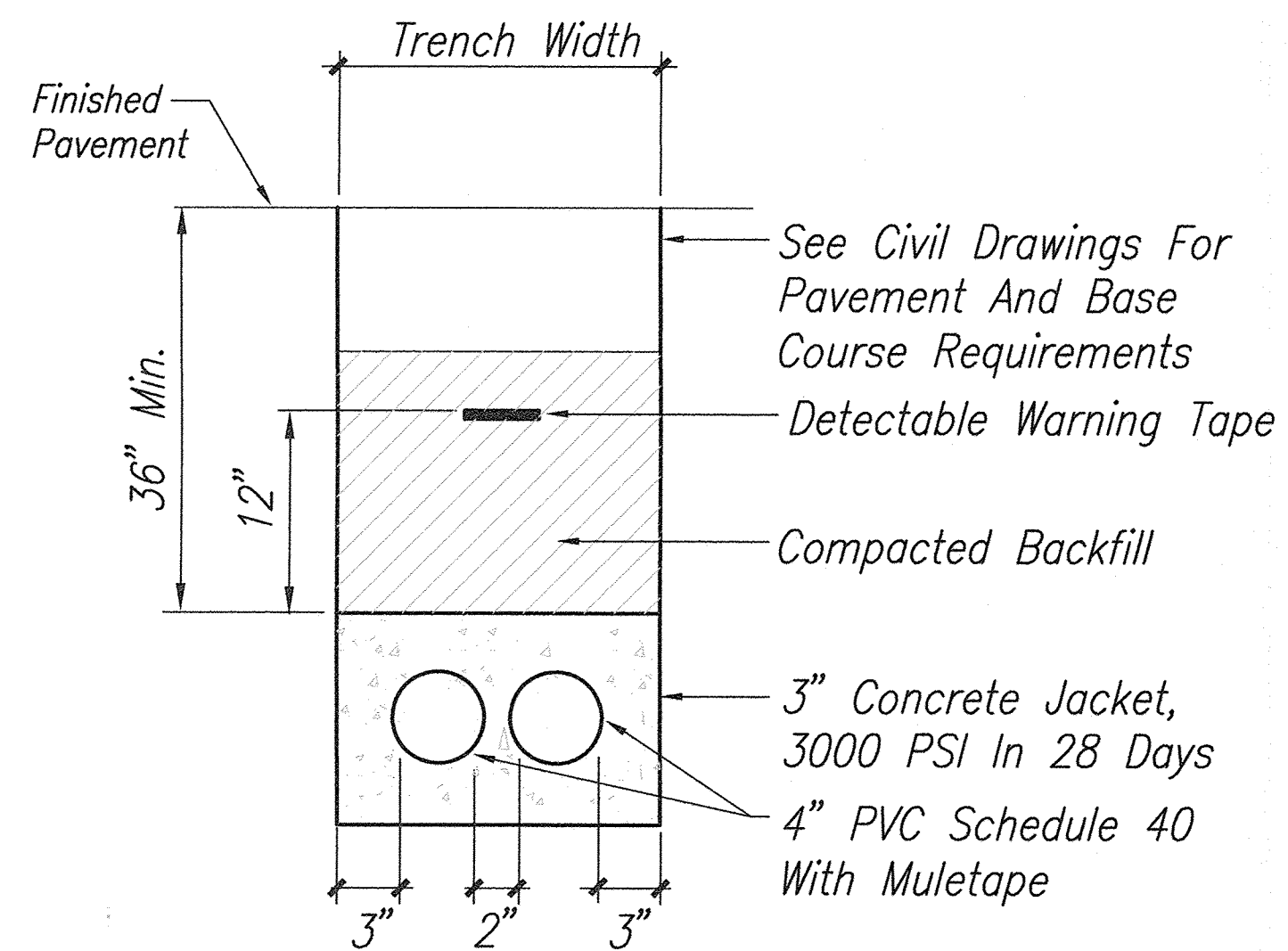
Scale: As Noted Date: February 2021

SHEET No. S124 OF 5 SHEETS

| | | | | | |
|---------------------|-------|--------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 146 | 161 |



1 TYPICAL UTILITY COMPANY DUCT SECTION
E-1 Not To Scale



2 SIGNAL CORPS DUCT SECTION
E-1 Not To Scale

| SYMBOL | | DESCRIPTION |
|-------------|-------------|--|
| EXISTING | NEW | |
| »--○ | »--○ | Street Light Luminaire And Bracket Arm Mounted On Joint Utility Pole |
| □ | □ | Manhole Or Handhole, Type As Noted |
| P16 ○ | P16 ○ | Joint Pole, Pole #16 Indicated |
| -----+----- | -----+----- | Guy And Anchor |
| -----e----- | -----e----- | Underground Ductline |
| -ooh----- | -OH/- | Overhead Wiring (ST=Sub Transmission, P=Primary, S=Secondary, N=Neutral, T=Telephone, TV=Cable Television, SL=Street Lighting, G=Guy Wire) |
| | X | Denotes Demolition/Removal |
| | 2 E-2 | Detail Indicator: Top Half Denotes Detail Number, Left Denotes Sheet On Which Detail Shown |
| | GND | Ground |
| | HECo | Hawaiian Electric Company |
| | HT | Hawaiian Telecom |
| | WP | Weatherproof |
| | 1 | Note Indicator |

Kaipapau Utility Relocation
46/12kV Overhead

HAWAIIAN ELECTRIC CO., INC.
ENGINEERING DEPT.

HECO DWG. or P.O. NO. 1-1/-1 REV. 0

TYPE OF REVIEW

Preliminary, submit final copy
 Revise as noted & resubmit for review
 Revise as noted & submit final copy
 Final review
 As to substance only without comments
 Submit reproducible per Specs

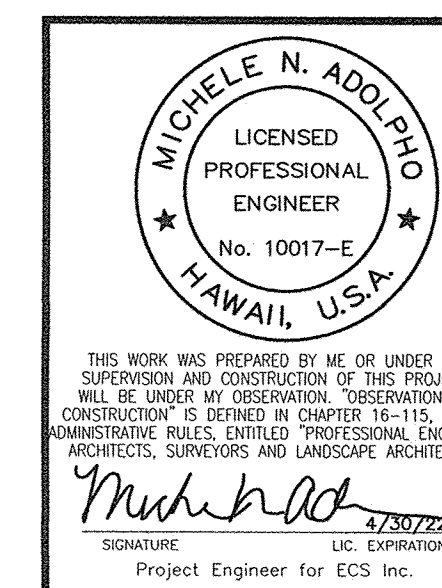
Reviewed By: I. LEE Date: 12/4/20

Reviewed M E CSA
SU CU

Hawaiian Electric Company's review shall in no way relieve Vendor/Contractor from responsibility for engineering, design, workmanship, material, performance of equipment and material, and any other liability under contract or by law.

APPROVED

Signature: [Signature] Date: 12/15/20
Hawaiian Telcom Project Engineer for ECS Inc.



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
ELECTRICAL SYMBOL LIST
AND DUCT DETAILS
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)
Scale: As Noted Date: November 2020

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| QUANTITIES BY | |
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| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
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| HAWAII | HAW. | BR-083-1(48) | 2021 | 147 | 161 |

HIGHWAY LIGHTING NOTES:

1. The Contractor shall notify the State Highways, Highway Lighting and Traffic Supervisor 72 hours in advance before commencing work on the highway lighting system. Phone: 837-8056.
2. All luminaires shall be LED type with wattage, initial lumen output, and I.E.S. Type light distribution as shown on the approved plans.
3. The Contractor shall have one set of approved plans at job site at all times during the construction work and record all changes which occur during construction of the highway lighting system.
4. Contractor to stencil date of installation at the bottom of each lighting control node.
5. Final acceptance and inspection will be undertaken only after all work has been completed.
6. Temporary Lighting: The Contractor shall schedule the construction work in such a manner that highway lighting is provided during all hours of darkness either with new, temporary or existing luminaires or a combination thereof. Temporary pole assemblies, wiring and connections may need to be utilized. Temporary wiring may be installed in exposed conduit, where not subject to vehicular damage, or with overhead wiring. Overhead wiring shall be a minimum of 20 feet above roadways at its lowest measured point, unless approved by the Engineer.
7. All temporary pole locations shall be staked, and approval of locations shall be obtained from the Engineer before installation. Pole locations in the field will be required to clear underground and aerial utility lines. New pole locations shall not conflict with any existing or proposed utility and shall not obstruct any roadway sign. The Contractor shall be responsible for costs incurred by conflicting utilities.
8. The Contractor shall at his expense, keep the project and surrounding area free from dust nuisance and shall be responsible for cleaning and removal of all silt and debris generated by the excavation work and deposited and accumulated within downstream waterways, ditches, drain pipes and on public roadways. Any citations (fines) received by the State for the Contractor's noncompliance of any Department of Health regulations shall be deducted from the progress payment.
9. The Contractor shall locate existing buried utility lines in the vicinity of the excavation work prior to commencing excavation. As a minimum, an electronic magnetic device for detection of buried lines shall be utilized prior to excavation. Trenches shall be excavated with care. The Contractor shall be responsible for damages to existing utilities resulting from his negligence and shall bear cost of repairs to the utilities. Method of repair shall be approved by the State.
10. The Electrical Contractor shall have personnel on the project that comply with the following qualifications:
 - a. One (1) registered master electrician in the company.
 - b. Certified journeyman electrician at each construction location to perform splicing of cables and all required wiring work.
11. Submit lighting calculations using the proposed luminaire for acceptance by the Engineer. Lighting criteria shall be as follows:

Contractor shall maintain existing circuiting or provide temporary connections to existing highway lights through construction of the new highway lighting system. Existing highway lights scheduled for demolition shall remain in operation to maintain existing illumination levels utilizing either existing or temporary pole assemblies, luminaires, wiring and connections until new highway lights can be energized and are approved by the Engineer. New highway lights shall be energized by either permanent or temporary wiring and connections prior to demolition of the existing highway lighting system.

Submit all proposed temporary lighting plans to the Engineer for review and acceptance. Temporary lighting standard assemblies, if required, and associated structural support design shall be stamped by a registered structural engineer and submitted to the Engineer for acceptance.

Temporary highway lighting systems shall be removed after completion of bridge replacement. Costs associated with removal of the temporary lighting system shall be considered incidental to the cost of the temporary highway lighting system.

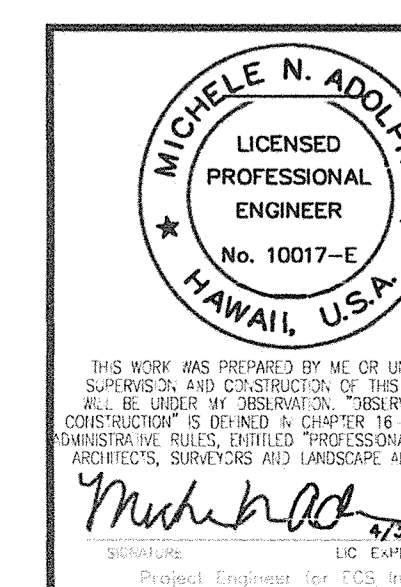
Design Illumination Level = 0.8 footcandle average maintained.

Design Uniformity Ratio
(Average to Minimum) = 3.5 to 1 maximum.

Design Maintenance Factor = 0.85

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING NOTES

Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

Scale: As Noted

Date: November 2020

SHEET No. E-2 OF 16 SHEETS

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 148 | 161 |

HAWAIIAN ELECTRIC COMPANY NOTES:

1. Location Of Hawaiian Electric Facilities

The location of Hawaiian Electric's overhead and underground facilities shown on the plans are from existing records with varying degrees of accuracy and are not guaranteed as shown. The Contractor shall verify in the field the locations of the facilities and shall exercise proper care in excavating and working in the area. Wherever connections of new utilities to existing utilities and utility crossings are shown, the Contractor shall expose the existing lines at the proposed connections and crossings to verify the depths prior to excavation for the new lines. The Contractor shall be responsible for any damages to Hawaiian Electric's Facilities whether shown or not shown on the plans.

2. Compliance with Hawaii Occupational Safety and Health Laws

The Contractor shall comply with the state of Hawaii's Occupational Safety and Health Laws and Regulations, including without limitation, those related to working on or near exposed or energized electrical lines and equipment.

3. Excavation Clearance

The Contractor shall obtain an excavation clearance from Hawaiian Electric's Planning and Design Section of the Customer Installations Division (543-5654) located at 820 Ward Avenue, 4th floor, a minimum of ten (10) working days prior to starting construction.

4. Caution!!! Electrical Hazard!!!

Existing Hawaiian Electric overhead and underground lines are energized and will remain energized during construction unless prior special arrangements have been made with Hawaiian Electric. Only Hawaiian Electric Personnel are to handle these energized lines and erect temporary guards to protect these lines from damage. The Contractor shall work cautiously at all times to avoid accidents and damage to existing Hawaiian Electric Facilities, which can result in electrocution.

5. Overhead Lines

State Law (OSHA) requires that a worker and the longest object he or she may contact cannot come closer than a specified minimum radial clearance when working close to or under any overhead lines. It is the Contractor's responsibility to be informed of and comply with the law.

At any time should the Contractor anticipate that his work will result in the need to encroach within the minimum required clearance as stated in the law, the Contractor shall notify Hawaiian Electric at least three (3) months prior to the planned

encroachment so that, if feasible, the necessary protections (e.g. Relocate or de-energize Hawaiian Electric lines) can be investigated. Hawaiian Electric may also be able to blanket its distribution (12kV and below) lines to provide a visual aid in preventing accidental contact. Hawaiian Electric's cost of safeguarding or identifying its lines will be charged to the Contractor. Contact Hawaiian Electric's Customer Installations Division at 543-7070 for assistance in identifying and safeguarding overhead power lines.

6. Pole Bracing

Contractor shall not excavate within 10 feet of Hawaiian Electric's utility poles or any anchor system supporting the utility pole. If Contractor must excavate an area more than 12 inches deep by 12 inches wide, and closer than 10 feet from a utility pole or its anchor system, Contractor will be responsible for protecting, supporting, securing and taking all precautions to prevent damage to or leaning of existing poles. Before commencing such excavation, Contractor must notify Hawaiian Electric which may lead to implementing pole bracing requirements. Hawaiian Electric requires a minimum of ten (10) working days to conduct the review of Contractor's Submittal. Contractor shall submit its bracing calculations and drawings, prepared and stamped by a licensed structural engineer, to Hawaiian Electric's Customer Installations Division (543-7070) for review. Contractor shall be responsible for the design, installation, and removal of the temporary pole bracing system, as well as all costs incurred by Hawaiian Electric to review Contractor's drawings and to repair or straighten poles impacted by Contractor's activities, including response and restoration costs incurred by Hawaiian Electric arising out of or related to outages caused by Contractor's failure to meet the foregoing requirements. Hawaiian Electric's receipt of pole bracing calculation or drawing submittals of any Contractor, including work procedure, shall not relieve Contractor from any liability resulting from Contractor's excavation near or around Hawaiian Electric's utility poles.

7. Underground Lines

The Contractor shall exercise extreme caution whenever construction crosses or is in close proximity of underground lines. Hawaiian Electric's existing electrical cables are energized and will remain energized during construction. Only Hawaiian Electric Personnel are to break into existing Hawaiian Electric Facilities, handle these cables, and erect temporary guards to protect these cables from damage. The cost of Hawaiian Electric's assistance in providing proper support and protection of its underground lines will be charged to the Contractor. For assistance/coordination in providing proper support and protection of these lines, the Contractor shall call Hawaiian Electric's Customer Installations Division at 543-7070 a minimum of ten

(10) working days in advance.

Special precautions are required when excavating near Hawaiian Electric's 138kV or 46kV underground lines (see Hawaiian Electric Instructions to Consultants/Contractors on "Excavation Near Hawaiian Electric's Underground 138kV and/or 46kV lines" for Detailed Requirements). For verification of underground lines, the Contractor shall call the Hawaii One Call Center at 866-423-7287 minimum of five (5) working days in advance.

8. Underground Fuel Pipelines

The Contractor shall exercise extreme caution whenever construction crosses or is in close proximity of Hawaiian Electric's underground fuel oil pipelines. Special precautions are required when excavating near Hawaiian Electric's underground fuel oil pipelines (see Hawaiian Electric's Specific Fuel Pipeline "Guidelines" to consultants/Contractors on excavation near Hawaiian Electric's Underground Fuel Pipelines for Detailed Requirements).

9. Excavations

When trench excavation is adjacent to or beneath Hawaiian Electric's existing structures or facilities, the Contractor is responsible for:

- Arranging for Hawaiian Electric Standby Personnel to observe work at Contractor's cost.
- Sheeting, bracing, or otherwise supporting the excavation and stabilizing the existing ground to render it safe and secure and to prevent possible slides, cave-ins, and settlements.
- Properly supporting existing structures or facilities with beams, struts, under-pinnings, or other necessary methods to fully protect it from damage.
- Backfilling with proper backfill material including special thermal backfill where existing (refer to Engineering Division for Thermal Backfill Specifications).

10. Relocation of Hawaiian Electric Facilities

Any work required to relocate or modify Hawaiian Electric Facilities shall be done by Hawaiian Electric, or by the Contractor under Hawaiian Electric's supervision. The Contractor shall be responsible for all coordination, and shall provide necessary support for Hawaiian Electric's work, which may include, but not be limited to, staking of pole/anchor locations, identifying right of way and property lines, excavation and backfill, permits and traffic control, barricading, and restoration of pavement, sidewalks, and other facilities. All costs associated with any relocation or modification (either temporary or permanent) for the convenience of the Contractor, or to enable the Contractor to perform his work in a safe and expeditious manner in fulfilling his contract obligations shall be borne by the Contractor.

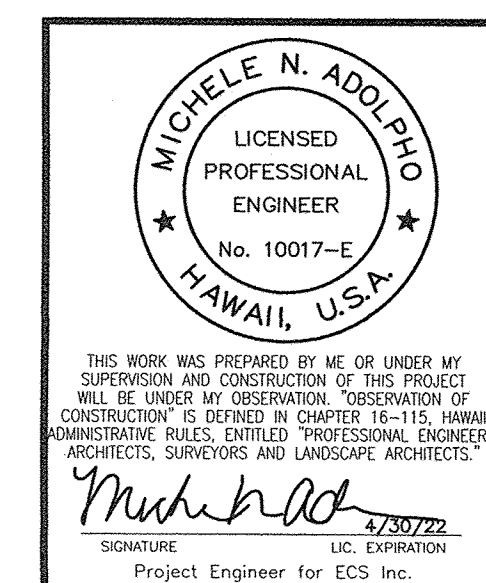
11. Conflicts

Any redesign or relocation of Hawaiian Electric's Facilities not shown on the plans may be cause for lengthy delays. The Contractor acknowledges that Hawaiian Electric is not responsible for any delay or damage that may arise as a result of any conflicts discovered or identified with respect to the location or construction of Hawaiian Electric's electrical facilities in the field, regardless of whether the Contractor has met the requested minimum advance notices. In order to minimize any delay or impact arising from such conflicts, Hawaiian Electric should be notified immediately upon discovery or identification of such conflict.

12. Damage to Hawaiian Electric Facilities

The Contractor shall be responsible for the protection of all Hawaiian Electric surface and subsurface utilities and shall be responsible for any damages to Hawaiian Electric's Facilities as a result of his operations. The Contractor shall immediately report such damages or any hazardous conditions related to Hawaiian Electric's lines to Hawaiian Electric's Trouble Dispatcher at 548-7961. Repair work shall be done by Hawaiian Electric or by the Contractor under Hawaiian Electric's supervision. Costs for damages to Hawaiian Electric's Facilities shall be borne by the Contractor in case of damage or suspected damage to Hawaiian Electric's fuel pipeline, the Contractor shall immediately notify Hawaiian Electric's Security Command Center at 543-7685 (a 24-hour number) so Hawaiian Electric Personnel can secure the damaged section and report any oil spills to the proper authorities. All costs associated with the damage, repair, and oil spill cleanup shall be borne by the Contractor.

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| Kaipapau Utility Relocation | |
| 48/12kV Overhead | |
| HAWAIIAN ELECTRIC CO., INC. | |
| ENGINEERING DEPT. | |
| HECO DWG. or P.O. NO. | REV. |
| 1-11-2 | 0 |
| TYPE OF REVIEW | |
| <input type="checkbox"/> | Preliminary, submit final copy |
| <input type="checkbox"/> | Revise as noted & resubmit for review |
| <input type="checkbox"/> | Revise as noted & submit final copy |
| <input checked="" type="checkbox"/> | Final review |
| <input type="checkbox"/> | As to substance only without comments |
| <input type="checkbox"/> | Submit reproducible per Specs |
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| I. LEE | 12/4/20 |
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| Hawaiian Electric Company's review shall in no way relieve Consultant from responsibility for services performed and any other liability under contract or by law. | |



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
HAWAIIAN ELECTRIC
COMPANY NOTES
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

Scale: As Noted Date: November 2020

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| ORIGINAL PLAN | SURVEY PLOTTED BY | DATE |
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| HAWAII | HAW. | BR-083-1(48) | 2021 | 149 | 161 |

Table 1: Guidelines For Minimum Horizontal (Parallel) Clearances Between Hawaiian Electric And Other Underground Utilities

| Underground Utility | Hawaiian Electric Direct Buried Cable | Hawaiian Electric Direct Buried In Conduit (No Concrete Encasement) | Hawaiian Electric 3" (Minimum) Concrete Encasement | Applicable Notes: |
|---------------------------------------|---------------------------------------|---|--|-------------------|
| Hawaiian Electric DB Conduits | 12" | 3 | 0" | |
| Hawaiian Electric 3" Encasement | 0" | 0" | 0" | |
| Telephone / CATV DB | 12" | 12" | 6" | |
| Telephone / CATV DB Ducts | 12" | 12" | 6" | |
| Telephone / CATV 3" Encasement | 0" | 0" | 0" | 5 |
| Traffic Signal | 12" | 12" | 12" | |
| Water DB (BWS Owned) | 36" | 36" | 36" | 1, 4 |
| Customer Owned Water Service Laterals | 12" | 12" | 12" | |
| Water (Concrete Jacketed) (BWS Owned) | 36" | 36" | 36" | 1, 4 |
| Gas DB | 12" | 12" | 12" | 1 |
| Gas (Concrete Jacketed) | 12" | 12" | 12" | 1 |
| Sewer DB | 36" | 36" | 36" | 1, 2 |
| Sewer (Concrete Jacketed) | 36" | 36" | 36" | 1, 2 |
| Drain | 12" | 12" | 12" | 1 |
| Fuel Pipelines | | | | 3 |

Notes:

- Where space is available, parallel clearance to other utilities, or foreign structures other than communication or traffic signal shall be 36".
- If 36" clearance cannot be met:
 - If clearance is less than 12", jacket sewer line with reinforced concrete (per Hawaiian Electric's STD. 30-1030) for a distance of 5' plus pipe diameter.
 - If clearance is between 12" and 36", jacket sewer line with plain concrete.
- All fuel pipeline crossings shall be reviewed and approved by the company that owns and maintains it.
- 5 feet clear to water mains 16" and larger.
- For situations with 0" minimum separation, a 6" separation is recommended.
- Clearances measured from outer edges or diameters of utilities. Whenever concrete jackets are involved, clearances shall be total clear distance between the concrete jacket and utility concerned.

Table 2: Guidelines For Minimum Vertical (Crossing) Clearances Hawaiian Electric And Other Underground Utilities

| Underground Utility | Hawaiian Electric Direct Buried Cable | Hawaiian Electric Direct Buried In Conduit (No Concrete Encasement) | Hawaiian Electric 3" (Minimum) Concrete Encasement | Applicable Notes: |
|---------------------------------------|---------------------------------------|---|--|-------------------|
| Hawaiian Electric DB Conduits | 6" | 3" | 0" | |
| Hawaiian Electric 3" Encasement | 0" | 0" | 0" | |
| Telephone / CATV DB | 12" | 12" | 6" | |
| Telephone / CATV DB Ducts | 12" | 12" | 6" | |
| Telephone / CATV 3" Encasement | 0" | 0" | 0" | 3 |
| Traffic Signal | 12" | 12" | 6" | |
| Water DB (BWS Owned) | 12" | 12" | 12" | 5 |
| Customer Owned Water Service Laterals | 6" | 6" | 6" | |
| Water (Concrete Jacketed) (BWS Owned) | 12" | 12" | 12" | 5 |
| Gas DB | 12" | 12" | 12" | |
| Gas (Concrete Jacketed) | 12" | 12" | 12" | |
| Sewer DB | 24" | 24" | 24" | 1 |
| Sewer (Concrete Jacketed) | 24" | 24" | 24" | 1 |
| Drain | 12" | 12" | 6" | |
| Fuel Pipelines | | | | 2 |

Notes:

- If 36" clearance cannot be met:
 - If clearance is less than 12", jacket sewer line with reinforced concrete (per Hawaiian Electric's STD. 30-1030) for a distance of 5' plus pipe diameter.
 - If clearance is between 12" and 24", jacket sewer line with plain concrete.
- All fuel pipeline crossings shall be reviewed and approved by the company that owns and maintains it.
- For situations with 0" minimum separation, a 6" separation is recommended.
- Clearances measured from outer edges or diameters of utilities. Whenever concrete jackets are involved, clearances shall be total clear distance between the concrete jacket and utility concerned. Hawaiian Electric Company's review shall in no way relieve Consultant from responsibility for services performed and any other liability under contract or by law.
- 36" clearance is required for trenchless installation work.

Kaipapau Utility Relocation
46/12kV Overhead

HAWAIIAN ELECTRIC CO., INC.
 ENGINEERING DEPT.

HECO DWG. or P.O. NO. **1-11-3** REV. **0**

TYPE OF REVIEW

Preliminary, submit final copy
 Revise as noted & resubmit for review
 Revise as noted & submit final copy
 Final review
 As to substance only without comments
 Submit reproducible per Specs

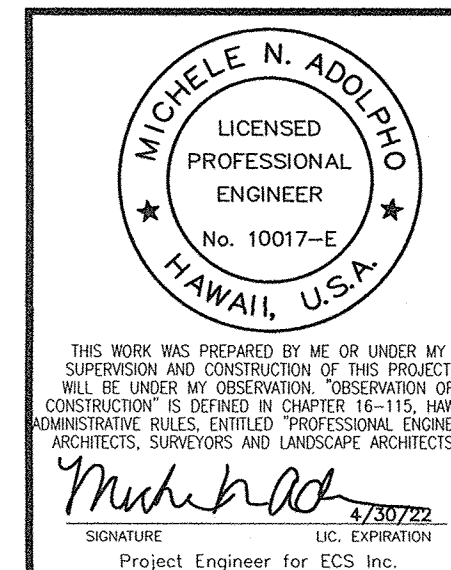
Reviewed By: **I. LEE** Date: **12/4/20**

Reviewed: M E CSA
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Hawaiian Electric Company's review shall in no way relieve Vendor/Contractor from responsibility for engineering, design, workmanship, material, performance of equipment and material, and any other liability under contract or by law.

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STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
HAWAIIAN ELECTRIC
 COMPANY NOTES
 Kamehameha Highway
 Kaipapau Stream Bridge Replacement
 Federal Aid Project No. BR-083-1(48)

Scale: As Noted Date: November 2020

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 150 | 161 |

HAWAIIAN ELECTRIC COMPANY NOTES (CONT.):

13. Hawaiian Electric Stand-by Personnel
The Contractor may request Hawaiian Electric to provide an Inspector to stand-by during construction near Hawaiian Electric's Facilities. The cost of such inspection will be charged to the Contractor.
The Contractor shall call Hawaiian Electric's Customer Installations Division at 543-7070 a minimum of three (3) months in advance to arrange for Hawaiian Electric Stand-by Personnel.
14. Clearances
The following clearances shall be maintained between Hawaiian Electric's ductline and all adjacent structures (charted and uncharted) in the trench (See Tables 1 & 2 on Sheet E-4). The Contractor shall notify the Construction Manager & Hawaiian Electric of any heat sources (power cable duct bank, steamline, etc.) encountered that are not properly identified on the drawing.
15. Indemnity
The Contractor shall indemnify, defend and hold harmless Hawaiian Electric from and against all losses, damages, claims, and actions, including but not limited to reasonable attorney's fees and costs based upon or arising out of damage to property or injuries to persons, or other tortious acts caused or contributed to by Contractor or anyone acting under its direction or control or on its behalf; provided Contractor's indemnity shall not be applicable to any liability based upon the sole negligence of Hawaiian Electric.
16. Schedule
Contractor shall furnish his construction schedule six (6) months prior to starting work on Hawaiian Electric Facilities. Contractor shall give Hawaiian Electric, in writing, three (3) months notice to proceed with Hawaiian Electric's portion of work.
17. Authority
All construction, restoration work, and inspection shall be subject to whichever governmental agency has authority over the work.
18. Specifications
Construction of Hawaiian Electric's Underground Facilities shall be constructed in accordance with the latest revisions of Hawaiian Electric Specifications CS7001, CS7003, CS7202, CS9301, and CS9401 and applicable Hawaiian Electric Standards.

19. Construction
Contractor shall furnish all labor, materials, equipment, and services to properly perform and fully complete all work shown on the contract, drawings, and specifications. All materials shall be new and manufactured in the United States of America. All manhole, handhole, and ductline installations shall be inspected and approved by Hawaiian Electric prior to excavation and prior to placing concrete. Contractor shall notify Hawaiian Electric's Inspection Group at 543-2567 at least five (5) working days prior to installing facilities or placing concrete.
Contractor to coordinate work to break into Hawaiian Electric's existing electrical facilities with Hawaiian Electric's Inspection Group at 543-2567 at least ten (10) working days in advance.
20. Stakeout
The Contractor shall arrange for toneouts of all underground facilities and shall stakeout all proposed Hawaiian Electric Facilities within the project area so as to not conflict with any utility (existing or proposed) and any proposed construction or improvement work for verification by Hawaiian Electric before proceeding with Hawaiian Electric work.
21. Ductlines
All ductline installations shall be PVC Schedule 40 encased in concrete, unless otherwise noted. All completed ductlines shall be mandrel tested by the Contractor in the presence of Hawaiian Electric's Inspector using Hawaiian Electric's Standard Practice. The Contractor shall install 1800# tensile strength muletape pull line in all completed ductlines after mandrel testing is complete.
22. Joint Pole Removal
The last joint pole occupant off the poles shall remove the poles.
23. As-Built Plans
The Contractor shall provide Hawaiian Electric with a set of electronic and hard copy plans of each sheet showing the offsets, stationing, and vertical elevation of the duct line(s) constructed.

US ARMY SIGNAL CORPS – NETWORK ENTERPRISE CENTER – HAWAII, JOINT TRUNKING SYSTEM/OUTSIDE CABLE PLANT GENERAL CONSTRUCTION NOTES:

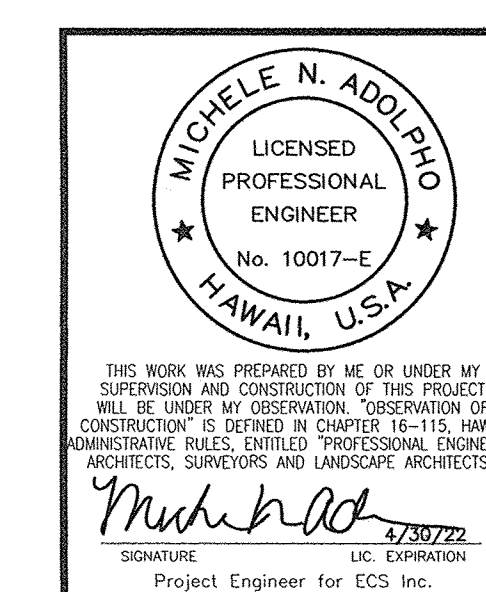
1. All work impacting US Army Signal Corps (SC) telecommunications facilities and infrastructure shall be completed in accordance with:
 - a. Military Standards and US Army Regulations (current version).
 - b. US Army Technical Criteria for the Installation Information Infrastructure Architecture (I3A) dated February 2010 (or most current). A copy of the I3A Technical Criteria can be found at: <http://www.lrl.usace.army.mil/ed2/article.asp?id=1416&MyCategory=212>.
 - c. National Electric Code (NEC) and National Electric Safety Code (NESC), most current version.
 - d. ANSI/TIA/EIA Telecommunication Standards.
 - e. National Electrical Manufacturer's Association (NEMA) Bulletin No. TCB 2-2000.

NOTE: The Contractor shall be responsible for acquisition of all applicable guidance and directives.
2. The Contractor shall ensure the following for OSP placements:
 - a. All duct joints shall be reamed to avoid burrs, obstructions, or areas where the mandrel will not flow freely or smoothly. Contractors shall utilize the NEMA Bulletin No. TCB 2-2000 for the general guidelines on the selection and installation of underground non-metallic duct. An electronic copy of this file is available at: <http://www.nema.org/stds/tcb2.cfm>.
 - b. All protruding surfaces in the communication ducts at the joints of connection points shall be repaired or replaced by the Contractor until accepted by the Government and/or the Government Service Provider.
 - c. All new communication ducts shall be swabbed (cleaned) and bi-directional mandrel tested by the Contractor. Ducts shall be completely dry and clean (free of dirt, rocks and debris).
 - d. Mandrels shall flow freely and smoothly with no noticeable obstructions or hang-ups.
 - e. All equipment and personnel for mandrel testing shall be provided by the Contractor.
- f. Mandrels used for communication duct testing shall be 12-inches in length, solid, non-tapered, and a diameter of 0.25-inches less than the inner diameter of the ducts being tested.
- g. Government and/or Government Service Provider shall witness all mandrel testing and Government and/or Government Service Provider acceptance of mandrelled ducts is required.
- h. Upon completion of mandrel testing, ducts shall be plugged in order to prevent debris from entering before use.
3. The Contractor shall ensure the casting of all "new" maintenance hole covers bear the imprinting of the words "USA Signal Corps." The inside neck of the maintenance hole shall be permanently labeled with the maintenance hole identifier provided by the Government.
4. The cover and ring of the maintenance hole shall be manufactured with thread holes (5/8" threads) to accept security bolts. Security patterns are unique to the US Army.
5. The Contractor shall obtain and fund for all required permits, notices, licenses and authorizations for the intended work for Federal and US Military Facilities and infrastructure.
6. The Contractor shall be responsible to validate military and defense cables identified and shall ensure other utilities/facilities, both aerial and underground, are secured and not impacted during operation. Outages and damages to other utilities shall be the responsibility of the Contractor.
7. The Network Enterprise Center POC is Mr. Walter Selders, walter.l.selders.civ@mail.mil, (808) 787-5357. Alternate POC is Mr. Barton Wynn, barton.j.wynn.civ@mail.mil, (808) 787-1799.

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| Kaipapau Utility Relocation 46/12kV Overhead | |
| HAWAIIAN ELECTRIC CO., INC. ENGINEERING DEPT. | |
| HECO DWG. or P.O. NO. | REV |
| 1-1-4 | 0 |
| TYPE OF REVIEW | |
| <input type="checkbox"/> Preliminary, submit final copy <input type="checkbox"/> Revise as noted & resubmit for review <input type="checkbox"/> Revise as noted & submit final copy <input checked="" type="checkbox"/> Final review <input type="checkbox"/> As to substance only without comments <input type="checkbox"/> Submit reproducible per Specs | |
| Reviewed By: | Date |
| I. LEE | 12/4/20 |
| Reviewed | M E CSA |



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HAWAIIAN ELECTRIC COMPANY NOTES
US ARMY SIGNAL CORPS NOTES
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

Scale: As Noted Date: November 2020

HAWAIIAN TELCOM NOTES:

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 151 | 161 |

1. The Contractor shall procure and pay for all licenses and permits and shall give all notices necessary and incident to the due and lawful prosecution of the work.
2. The Contractor shall obtain an excavation permit and toning request from Hawaiian Telcom's Excavation Permit Section, located at 1177 Bishop Street, two weeks prior to the start of construction. Hours of business are 8:00am to 11:00am and 12:00pm to 3:00pm Monday through Friday, except holidays.
3. Prior to the excavation of the ductline, the Contractor shall request Hawaiian Telcom to locate existing ductline wherever required. For underground cable locating and marking, five (5) working days advance notice is required. Three (3) working days advance notice is required for any inspection by a designated representative.
4. The locations of existing utilities are approximate only. The Contractor shall exercise extreme caution and shall maintain proper clearances whenever construction crosses or is in close proximity of Hawaiian Telcom facilities. The Contractor shall verify their locations and shall be liable for any damages to Hawaiian Telcom facilities. Any damages shall be reported immediately to Hawaiian Telcom's repair section at #611 (24 hours) or to the excavation permit section at 546-7746 (normal working hours, Monday through Friday, except holidays). As a result of his operations, adjustments to the new ductline alignment, if required, shall be made to provide the required clearances.
5. The Contractor shall take necessary precaution not to damage existing cables or ducts. A Hawaiian Telcom inspector or designated representative is required to be at any job site whenever there will be a breakage into or entry into any structure that contain Hawaiian Telcom's facilities. Temporary cable and duct supports shall be provided wherever necessary.
6. The Contractor shall notify Hawaiian Telcom's inspector or designated representative a minimum of 72 hours prior to excavation, bracing, or backfilling of Hawaiian Telcom's structures or facilities.
7. All applicable construction work shall be done in accordance with the "Hawaiian Telcom Standard Specifications for Placing Telephone Systems" dated January 2007, all subsequent amendments and additions, and all other pertinent standards for telephone construction. Contractor shall familiarize his personnel by obtaining applicable specifications.
8. When excavation is adjacent to or beneath Hawaiian Telcom's existing structures or facilities, the Contractor shall:
 - a) Sheet and/or brace the excavation to prevent slides, cave-ins, or settlements to ensure no movement to Hawaiian Telcom's structures or facilities.
 - b) Protect existing structures and/or facilities with beams, struts, or underpinning while excavating beneath them to ensure no movement to Hawaiian Telcom's structures or facilities.
9. The Contractor shall brace all poles or light standards near the new ductline, manhole, or handhole during his operations.
10. The Contractor shall saw-cut A.C. pavement and concrete gutter wherever new manholes, handholes, or ductlines are to be placed and shall restore to existing condition or better.
11. The Contractor shall comply with the policy adopted by the Department of Planning and Permitting, City and County of Honolulu, concerning the replacement of concrete sidewalks after excavation work.
12. The underground pipes, cables, or ductlines known to exist by the engineer from his search of records are indicated on the plans. The Contractor shall verify the locations and depths of the facilities and exercise proper care in excavating in the area. Wherever connections of new utilities to existing utilities are shown on the plans, the Contractor shall expose the existing lines at the proposed connections to verify their locations and depths prior to excavation for the new lines.
13. Wherever connections to existing utilities are shown on the plans, the Contractor shall expose the existing lines prior to excavation of the main trenches to verify their locations and depths.
14. The Contractor, at his own expense, shall keep the project and surrounding area free from dust nuisance. The cost for supplementary measures, which will be required by the City and County, shall be borne by the Contractor.
15. The Contractor shall pump all manholes dry during final inspection.
16. The Contractor shall notify Hawaiian Telcom inspector 24 hours prior to the pouring of concrete or backfilling.
17. When connecting to manhole walls, all existing reinforcing bars shall be left intact. Ducts shall be adjusted in the field in order to clear reinforcing.
18. The Contractor shall be responsible for laying out all required lines and grades and shall preserve all bench marks and working points necessary to lay out the work correctly. The new ductline shall be adjusted by the Contractor to suit the existing conditions and the details as described in the plans.
19. Minimum concrete strength shall be:

| | |
|--------------|---|
| For ductline | 2500 PSI at 28 days |
| For manhole | 3000 PSI at 28 days or as specified in design notes |
20. Bends in the duct alignment, due to changes in grade shall have a minimum radius of 25 feet. All 90 degree c-bends at a pole or at the building floor slab penetration, shall have a bend radius of ten times the diameter of the duct or greater.
21. After ductline has been completed, a mandrel with a square front not less than 12" long and having a diameter of 1/4" less than the inside diameter of the duct, shall be pulled through each duct after which a brush with stiff bristles shall be pulled through to make certain that no particles of earth, sand, or gravel have been left inside. Ducts shall be completely dry and clean.
22. All ducts and conduits shall have an 1800# polyester mule-tape (Neptco, WP1800P, Hawaiian Telcom Material Code No. 571154) installed throughout its entire length. All ducts shall be capped to prevent entry of foreign material during construction and at the completion of installation.

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| ORIGINAL PLAN | DATE |
| NOTE BOOK | BY |
| DESIGNED BY | TC |
| QUANTITIES BY | |
| CHECKED BY | |

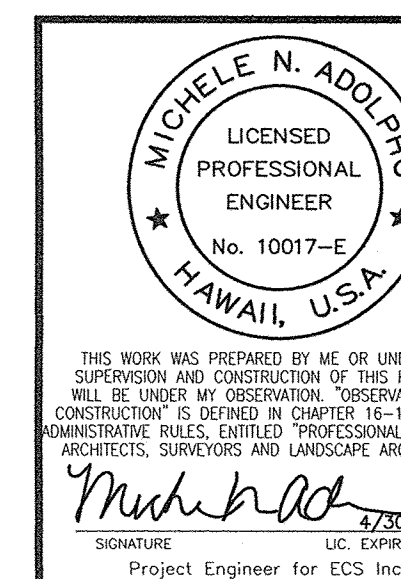
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RMTC JOB NO. : 1-19548-0E

APPROVED

Stephano
Hawaiian Telcom

12/15/20
Date



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HAWAIIAN TELCOM NOTES

Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

Scale: As Noted

Date: November 2020

SHEET No. E-6 OF 16 SHEETS

SPECTRUM NOTES:

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 152 | 161 |

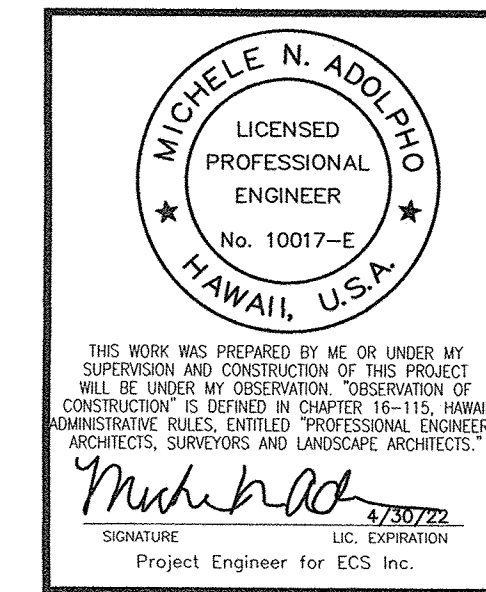
1. The Contractor shall procure and pay for all licenses and permits and shall give all notices necessary and incident to the due and lawful prosecution of the work.
2. The locations of existing utilities are approximate only. The Contractor shall verify their locations and shall be responsible for any damages to these utilities as a result of his operations. Adjustments to the new ductline alignment, if required, shall be made to provide the required clearances.
3. The Contractor shall brace all poles or light standards near the new ductline, manhole or handhole during its operations.
4. The Contractor shall saw-cut A.C. pavement, concrete gutter, and concrete sidewalk wherever new manholes, handholes, pullboxes or ductlines are to be placed and shall restore to existing condition or better.
5. The underground pipes, cables, or ductlines known to exist by the Engineer from his search of records are indicated on the plans. The Contractor shall verify the locations and depths of the facilities and exercise proper care in excavating in the areas. Wherever connections of new utilities to existing utilities are shown on the plans, the Contractor shall expose the existing lines at the proposed connections to verify their locations and depths prior to excavation for the new lines.
6. The Contractor, at his own expense, shall keep the project and surrounding area free from dust nuisance. The cost for supplementary measures, which will be required by The State, shall be borne by the Contractor.
7. Prior to the excavation of the ductline, the Contractor shall request that Spectrum to locate existing ductline wherever required.
8. The Contractor shall take necessary precaution not to damage existing cables or ducts. Any work involving existing cables or ducts shall be done in the presence of the Spectrum inspector or his representative.
9. The Contractor shall notify the Spectrum inspector 72 hours prior to the start of work on CATV infrastructure, pouring of concrete, or backfilling. Spectrum's inspector, Moki Place, can be reached at 306-0658.
10. Wherever connections to existing utilities are shown on the plans, the Contractor shall expose the existing lines prior to excavation of the main trenches to verify their locations and depths.
11. Contractor shall provide all materials and furnish all labor and equipment necessary to install the ductline in place complete.
12. The Contractor shall be responsible for laying out all required lines and grades and shall preserve all bench marks and working points necessary to lay out the work correctly. The new ductline shall be adjusted by the Contractor to suit the existing conditions and the details as described in the plans.
13. The Contractor, at his own expense, shall keep the project area free from dust nuisance. The work shall be in conformance with the Air Pollution Control Standards and Regulations of the State of Hawaii, Department of Health.
14. The location of CATV facilities shown on plans are from existing records with varying degrees of accuracy as to its actual fixed location. The Contractor shall use extreme caution when working in close proximity of CATV facilities.
15. The Contractor shall obtain excavation permit clearance from Spectrum's Engineering Section located at 200 Akamainui St., Mililani Tech Park.
16. Any work required to relocate CATV facilities shall be done by Spectrum and the Contractor shall be responsible for all coordination requirements and associated costs.
17. Any damage to Spectrum's Facilities shall be reported to Spectrum's Repair Dispatch Department at 625-8282.
18. The Contractor shall tunnel under existing concrete curb and gutter as necessary to extend conduit into existing CATV pullbox and into the proposed power supply pullbox.
19. All existing improvements that are disturbed during the construction phase shall be restored to its original or better condition at no cost to the State in accordance with State's Standards.
20. At locations where existing CATV pullbox replacement is proposed, the Contractor shall take all necessary precaution not to damage the existing cables in the pullbox. All damages to existing cables shall be repaired by Spectrum and paid for by the Contractor.
21. Coordinate all penetration of telephone pullboxes with GTE Hawaiian Tel Inspector.
22. Smooth finish inside wall of existing pullboxes and hand-holes to its original condition or better. All entrances into the pullbox shall be grouted around the conduits.
23. For conduits larger than 2", the Contractor shall install NEPTCO WP1800 muletape or approved equal in all ductlines, leave muletape in place for future use as a pull or fish line, unless otherwise noted. Reference GTE Material Code No. 571154. All ducts shall be capped to prevent entry of foreign material during construction and at completion of installation. Endbells are required for conduits 2" and larger.
24. For conduits equal or less than 2", the Contractor shall place poly cord through out project, and secure in manholes, handholes, and pullboxes. Endbells are required for conduits 2" and larger.
25. Penetration into pullboxes if necessary to be from factory installed opening or from bricks position. Penetration from pullbox walls is not acceptable. All conduits shall enter through the end of the pullbox at 90 degrees.
26. A minimum of (2) precast sections must be used on all 2x4 or 2x6 pullboxes.
27. Two minimum layers of bricks to be used shall always be at least one layer lower than the lowest duct entering the pullbox. At no time however, shall there be less than two layers of bricks on each installation.
28. At no time shall cement mortar, wood, or any other material be used between precast sections. Leveling or raising of boxes to grade must be done at brickwork section using cement mortar. The permanent installation of wooden wedges to accomplish this purpose will not be accepted.
29. Concrete precast base may be used as an alternative to bricks.
30. Trenching to be by hand digging near and across existing utility lines.
31. Minimum clearance between street light stand and fire hydrants shall be three feet.
32. Underground utilities shown hereon is for information only. No guarantee is made on the accuracy or completeness of said installation.
33. For underground cable locating and marking, five working days advance notice is required. Three working days advance notice is required for any inspection by a designated representative. Contractor shall take necessary precaution not to damage any existing cables or ducts. Spectrum's Inspector or designated representative is required to be at any job site whenever there will be a breakage into or entry into any structure that contain Spectrum's Facilities.
34. Concrete strength shall be 3000 psi in 28 days.
35. Bends in the duct alignment, due to changes in grade shall have a minimum radius of 20-feet. All 90-degree C-bends at a pole or at the building floor slab penetration, shall have a bend radius of ten times the diameter of the duct or greater.
36. After ductline has been completed, a mandrel with a square front, not less than 12-inch long, and having a diameter of 1/4-inch less than the inside diameter of duct, shall be pulled through each duct after which a brush with stiff bristles shall be pulled through to make certain that no particles of earth, sand, or gravel have been left inside. ducts shall be completely dry and clean.
37. Metallic entrance conduits shall be grounded.
38. All conduits within a building shall:
 - a) Be installed in the shortest and straightest possible run.
 - b) Have no section longer than 100-feet nor contain more than two 90-degree bends. An approved sized junction box or gutter box shall be placed if this is exceeded.
 - c) All bends shall be long sweep-radius bends but the inside radius of the bend must never be less than ten times the diameter of the conduit.
39. All construction must be Inspected and approved by Spectrum prior to the installation of any of its facilities and the energizing of its system.
40. Contractor and/or customer shall provide Spectrum with sufficient installation time in their occupancy time table.
41. Install 4-mil. thick orange color warning tape 3-inch wide, entire length of trench when placing CATV conduits. Tape should read "Caution Buried Cable Line Below". Manufactured by Harris Industries, Inc., catalog number UT-43 or equivalent tape. tape to be installed 12-inches below grade.
42. 5/8" copper ground rods shall be supplied and placed by Contractor in all pullboxes unless otherwise directed by Spectrum. Ground rods will be placed in the corner 3" to 4' from the wall and away from any conduit with no more than 8" sticking up above ground.

| | |
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| ORIGINAL PLAN | DATE |
| SURVEY PLOTTED BY | EST |
| DRAWN BY | TC |
| DESIGNED BY | |
| QUANTITIES BY | |
| CHECKED BY | |
| No. | |

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APPROVED

David Tamara 12/28/2020
Spectrum Date



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECTRUM NOTES

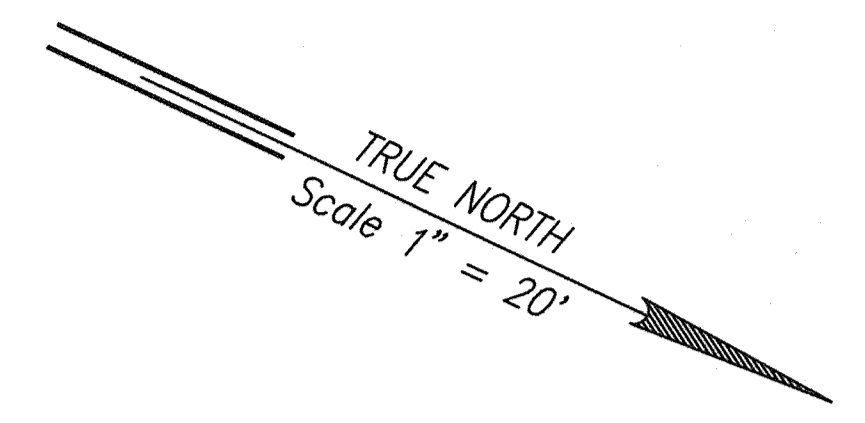
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

Scale: As Noted Date: November 2020

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 153 | 161 |

NOTES:

- 1 Remove Unmetered Street Light Luminaire And Bracket Arm. Joint Pole To Be Removed By The Last Joint Pole Owner On The Pole Prior To Construction Of Bypass Road.
- 2 Existing Overhead Conductors To Be Relocated/Removed By HECO, HT, And/Or Spectrum.
- 3 Coordinate Disconnection Of Utility Services With The Respective Utility Companies.
- 4 Maintain And Reconnect Existing Utility Services To Property Throughout The Construction Period.
- 5 Per U.S. Army Records, Existing Cable Is A 51 Pair, 19 Gauge, Tape-Armored Cable.
- 6 Existing 1-3" HECO, 1-1" HT Ductline To Be Intercepted. See E-10 For Additional Requirements.
- 7 Intercept Signal Corps Cable With New Manhole. See E-12 For Additional Requirements.
- 8 Existing 1-3" HECO Ductline To Be Intercepted. See E-10 For Additional Requirements.
- 9 Existing 1-1 HT Ductline To Be Intercepted. See E-10 For Additional Requirements.
- 10 Stub And Cap Existing 1-3" HECO Ductline.



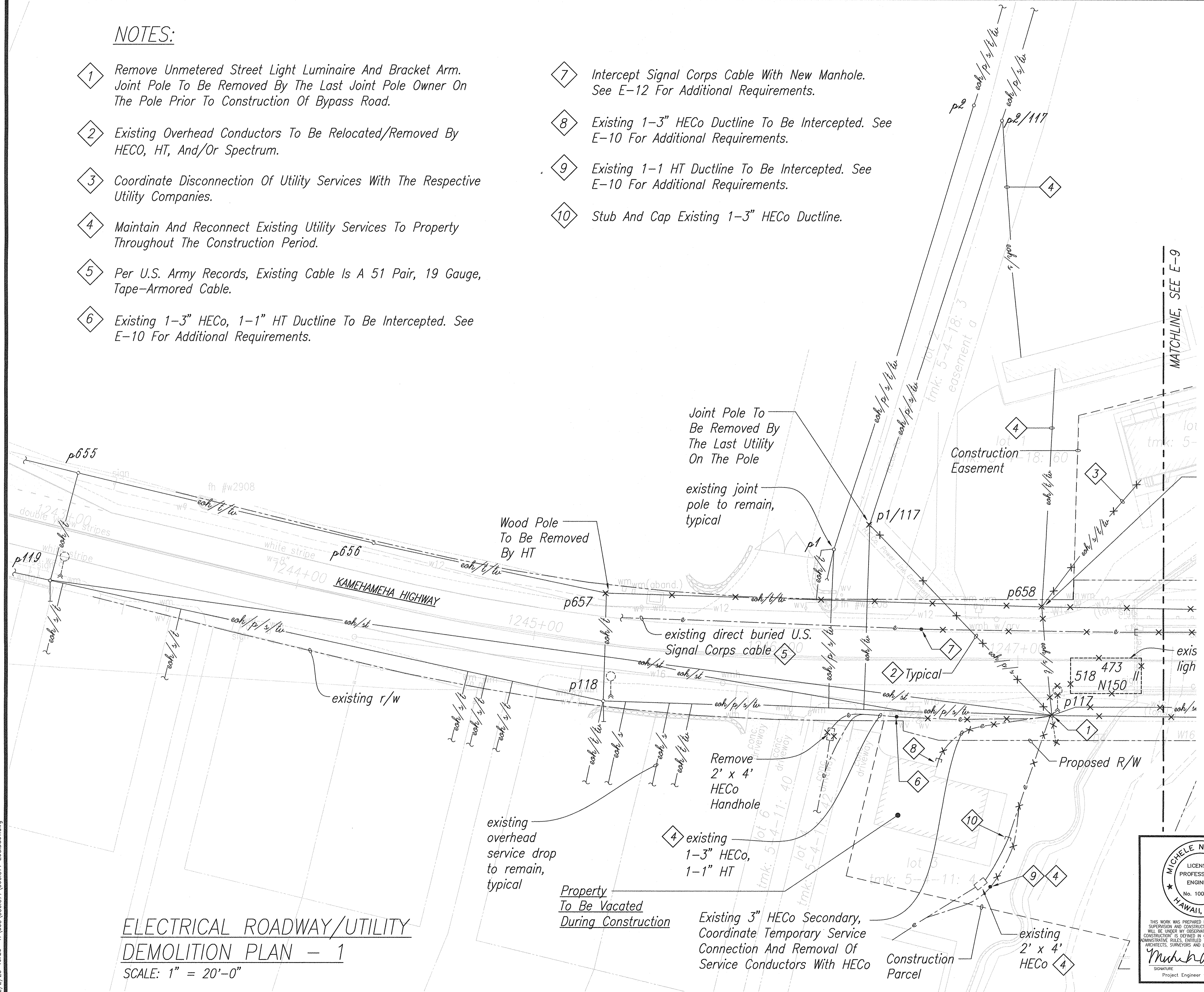
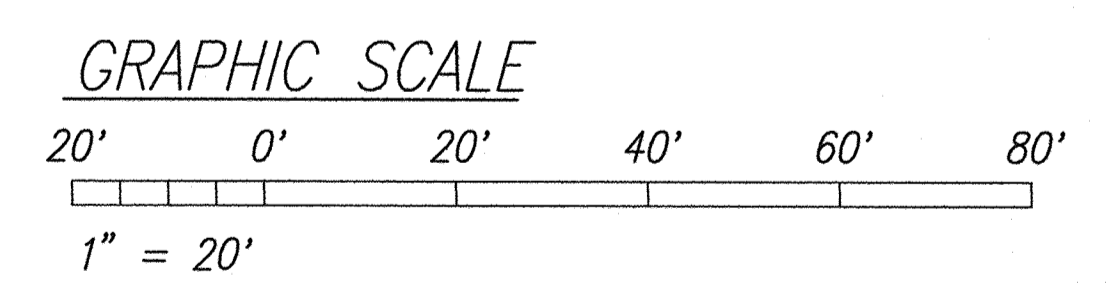
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| Kaipapau Utility Relocation | |
| 46/12kV Overhead | |
| HAWAIIAN ELECTRIC CO., INC. | |
| ENGINEERING DEPT. | |
| HECO DWG. or P.O. NO. | REV. |
| 1-1/-5 | 0 |
| TYPE OF REVIEW | |
| <input type="checkbox"/> | Preliminary, submit final copy |
| <input type="checkbox"/> | Revise as noted & resubmit for review |
| <input type="checkbox"/> | Revise as noted & submit final copy |
| <input checked="" type="checkbox"/> | Final review |
| <input type="checkbox"/> | As to substance only without comments |
| <input type="checkbox"/> | Submit reproducible per Specs |
| Reviewed By: | Date |
| I. LEE | 12/4/20 |
| Reviewed | M E CSA |
| | SU CU |

Hawaiian Electric Company's review shall in no way relieve Vendor/Contractor from responsibility for engineering, design, workmanship, material, performance of equipment and material, and any other liability under contract or by law.

APPROVED

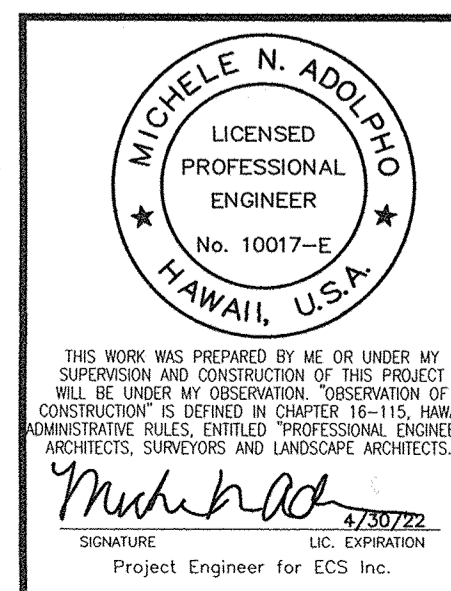
Stoke J. J. J. 12/15/20
Hawaiian Telcom Date

David J. J. 12/28/2020
Spectrum Date



ELECTRICAL ROADWAY/UTILITY DEMOLITION PLAN - 1
SCALE: 1" = 20'-0"

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|---------------|------|
| DESIGNED BY | DATE |
| TRACED BY | EST |
| DESIGNED BY | TC |
| QUANTITIES BY | |
| CHECKED BY | |
| ORIGINAL PLAN | |
| NOTE BOOK | |
| No. | |



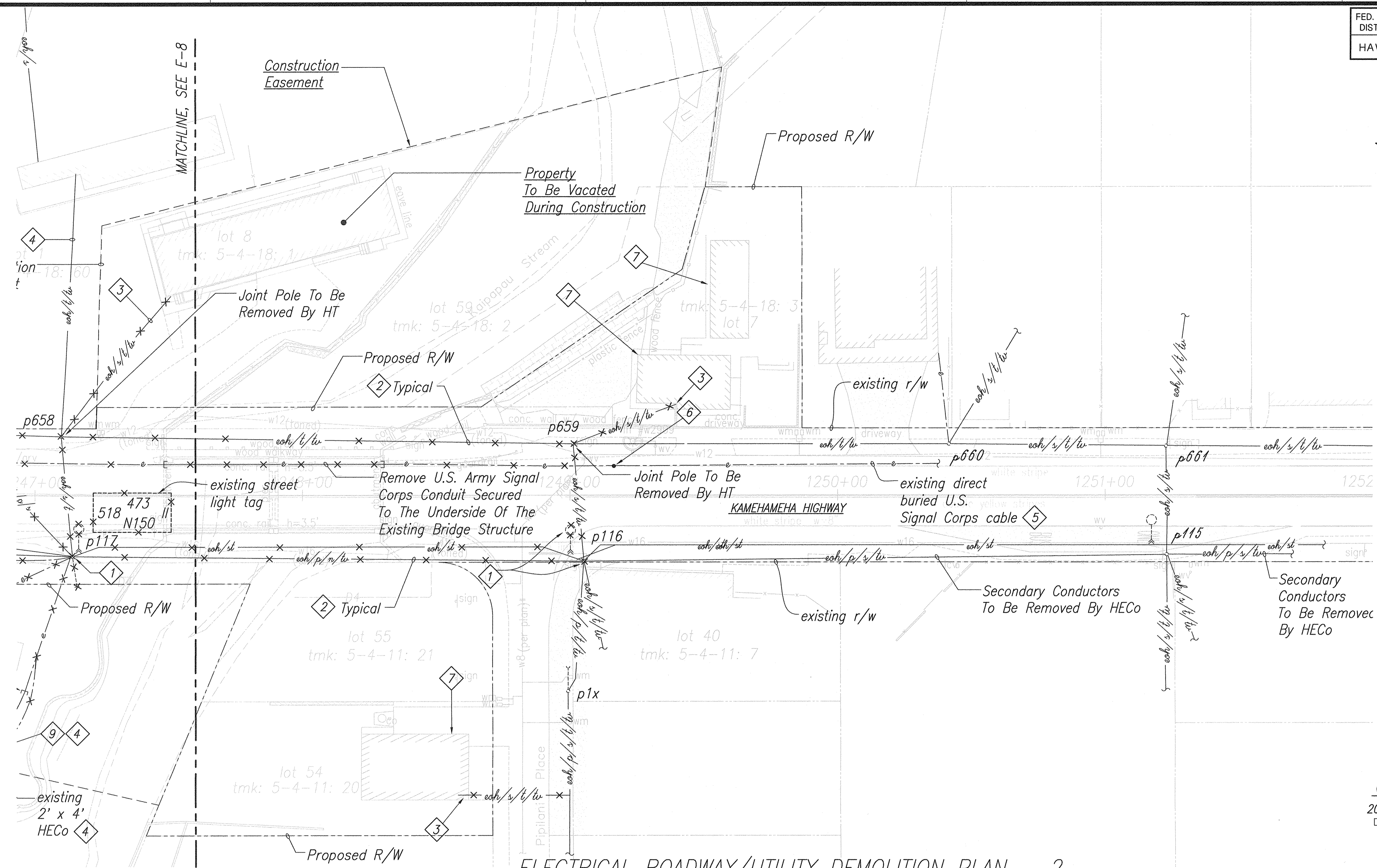
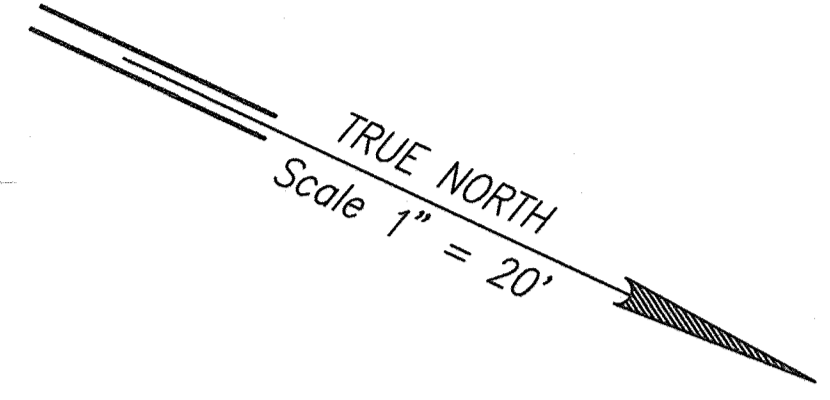
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL ROADWAY/UTILITY DEMOLITION PLAN - 1

Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

Scale: As Noted Date: November 2020

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 154 | 161 |

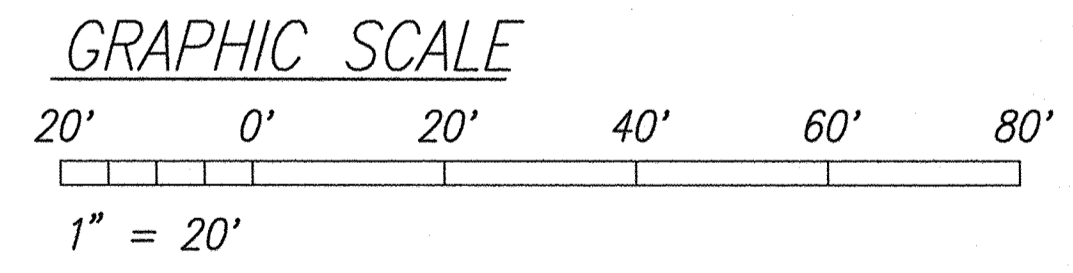


| Kaipapau Utility Relocation 46/12kV Overhead | |
|---|----------------|
| HAWAIIAN ELECTRIC CO., INC. ENGINEERING DEPT. | |
| HECO DWG. or P.O. NO. | REV. |
| 1-11-6 | 0 |
| TYPE OF REVIEW | |
| <input type="checkbox"/> Preliminary, submit final copy | |
| <input type="checkbox"/> Revise as noted & resubmit for review | |
| <input type="checkbox"/> Revise as noted & submit final copy | |
| <input checked="" type="checkbox"/> Final review | |
| <input type="checkbox"/> As to substance only without comments | |
| <input type="checkbox"/> Submit reproducible per Specs | |
| Reviewed By: I. LEE | Date: 12/14/20 |
| Reviewed: M E | SU CU CSA |
| Hawaiian Electric Company's review shall in no way relieve Vendor/Contractor from responsibility for engineering, design, workmanship, material, performance of equipment and material, and any other liability under contract or by law. | |

APPROVED

Stephen J. ... 12/15/20
Hawaiian Telcom Date

David Tamara 12/28/2020
Spectrum Date



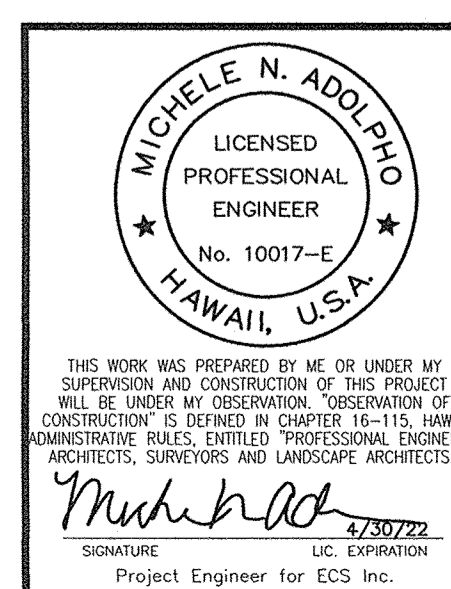
ELECTRICAL ROADWAY/UTILITY DEMOLITION PLAN - 2
SCALE: 1" = 20'-0"

NOTES:

- 1 Remove Unmetered Street Light Luminaire And Bracket Arm. Joint Pole To Be Removed By The Last Joint Pole Owner On The Pole Prior To Construction Of Bypass Road.
- 2 Existing Overhead Conductors To Be Relocated/Removed By HECO, HT, And/Or Spectrum.
- 3 Coordinate Disconnection Of Utility Services With The Respective Utility Companies.
- 4 Maintain And Reconnect Existing Utility Services To Property Throughout The Construction Period.
- 5 Per U.S. Army Records, Existing Cable Is A 51 Pair, 19 Gauge, Tape-Armored Cable.
- 6 Intercept Signal Corps Cable With New Manhole, See E-13 For Additional Requirements.
- 7 Building To Be Demolished Prior To Start Of Construction.

| | |
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| SURVEY PLOTTED BY | DATE |
| DESIGNED BY | BY |
| QUANTITIES BY | TC |
| CHECKED BY | |
| ORIGINAL PLAN | |
| NOTE BOOK | |
| No. | |

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**ELECTRICAL ROADWAY/UTILITY
DEMOLITION PLAN - 2**

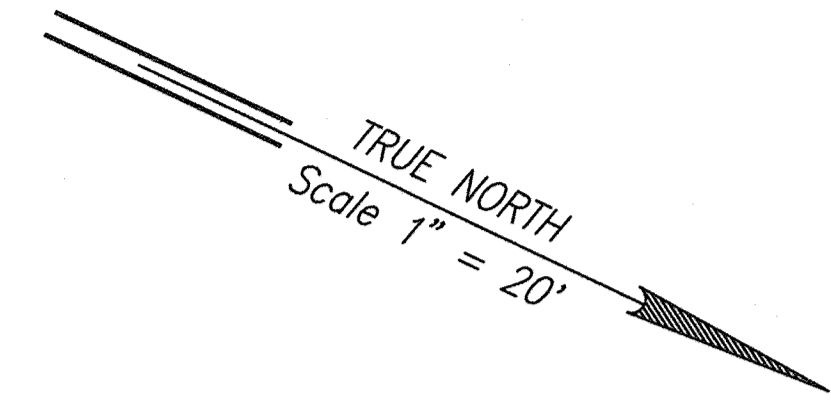
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

Scale: As Noted Date: November 2020

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 155 | 161 |

NOTES:

- 1 Temporary Joint Pole To Be Removed By The Last Joint Pole Owner On The Pole After Construction Of New Bridge Is Completed.
- 2 Overhead Conductors To Be Relocated Or Adjusted By The Utility Companies After Construction Of New Bridge Is Completed.
- 3 Temporary Street Light Luminaire To Be Removed After Construction Of New Bridge Is Completed.
- 4 Temporary Wood Pole To Be Removed By HT After Construction Of New Bridge Is Completed.
- 5 Intercept Existing 1-3" HECOs, 1-1" HT And Stubup At Temporary Joint Pole. For Typical Duct Section, See $\frac{1}{E-1}$
- 6 New 3" HECOs Secondary Ductline, Stub And Cap. For Typical Duct Section, See $\frac{1}{E-1}$
- 7 New 1-3" HECOs, 1-1" HT Ductline, Stubup At Temporary Joint Pole. Remove Ducts After Utility Companies Remove Cables In Ducts. For Typical Duct Section, See $\frac{1}{E-1}$
- 8 Intercept 1" HT Ductline.
- 9 Remove 1-3" HECOs Duct After HECOs Removes Cables In Duct. Work To Be Completed During The Permanent Phase.
- 10 New 1-3" HECOs Ductline, Stubup At Temporary Joint Pole. Coordinate Temporary Service Connection With HECOs. For Typical Duct Section, See $\frac{1}{E-1}$



Kaipapau Utility Relocation
46/12kV Overhead
 HAWAIIAN ELECTRIC CO., INC.
 ENGINEERING DEPT.
 HECOs DWG. or P.O. NO. **1-11-7** REV. **0**

TYPE OF REVIEW

- Preliminary, submit final copy
- Revise as noted & resubmit for review
- Revise as noted & submit final copy
- Final review
- As to substance only without comments
- Submit reproducible per Specs

Reviewed By: **I. LEE** Date: **12/4/20**

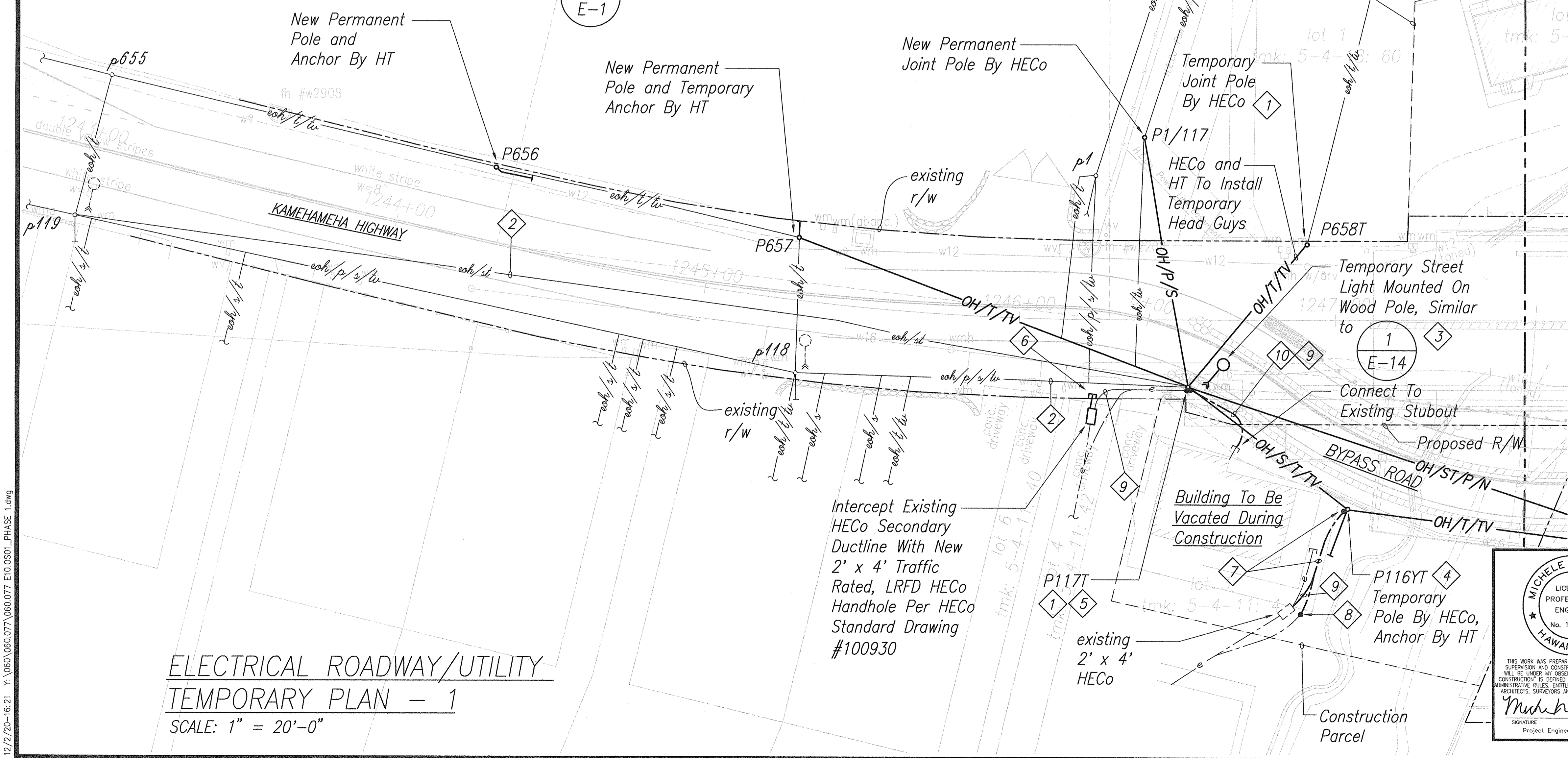
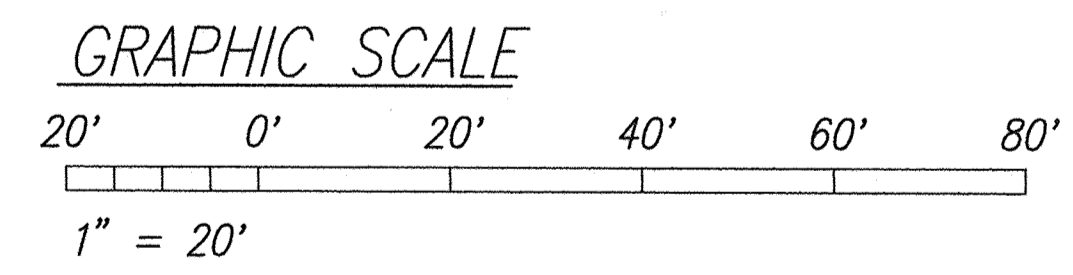
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Hawaiian Electric Company's review shall in no way relieve Vendor/Contractor from responsibility for engineering, design, workmanship, material, performance of equipment and material, and any other liability under contract or by law.

APPROVED

Stephen Jarvis 12/15/20
 Hawaiian Telcom Date

Dave Tammen 12/29/2020
 Spectrum Date



ELECTRICAL ROADWAY/UTILITY
TEMPORARY PLAN - 1
 SCALE: 1" = 20'-0"

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|---------------|------|
| ORIGINAL PLAN | DATE |
| DESIGNED BY | BY |
| DRAWN BY | BY |
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| QUANTITIES BY | BY |
| NOTE BOOK | NO. |

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MICHELE N. ADOLPHO
 LICENSED PROFESSIONAL ENGINEER
 No. 10017-E
 HAWAII, U.S.A.

Michelle Adolpho
 Project Engineer for ECS Inc.

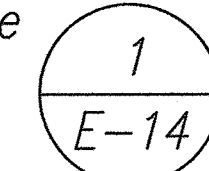
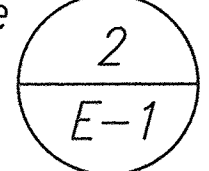
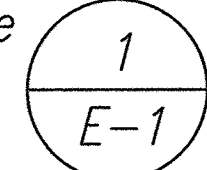
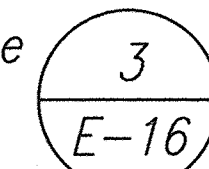
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

ELECTRICAL ROADWAY/UTILITY
TEMPORARY PLAN - 1
 Kamehameha Highway
 Kaipapau Stream Bridge Replacement
 Federal Aid Project No. BR-083-1(48)

Scale: As Noted Date: November 2020

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 157 | 161 |

NOTES:

- 1 Permanent Utility Pole, By Utility Companies, After Construction Of Bridge Replacement.
- 2 Relocated Or Adjusted Overhead Conductors By Utility Companies, After Construction Of Bridge Replacement.
- 3 New Unmetered LED Street Lighting Luminaire And Bracket Arm Mounted On Joint Pole, See 
- 4 2-4" PVC Schedule 40, Concrete Encased Signal Corps Ductline, See 
- 5 Permanent Utility Service Connection. Coordinate With The Respective Utility Companies.
- 6 For Typical Duct Section, See 
- 7 2' x 4' HECO Handhole Installed During Temporary Phase, See E-10.
- 8 Provide Stabilization Layer Below Manhole, See 

**Kaipapau Utility Relocation
46/12kV Overhead**

HAWAIIAN ELECTRIC CO., INC.
ENGINEERING DEPT.

HECO DWG. or P.O. NO. **1-1-9** REV. **0**

- TYPE OF REVIEW
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Reviewed By: I. LEE Date: 12/4/20

Reviewed M E CSA
SU CU

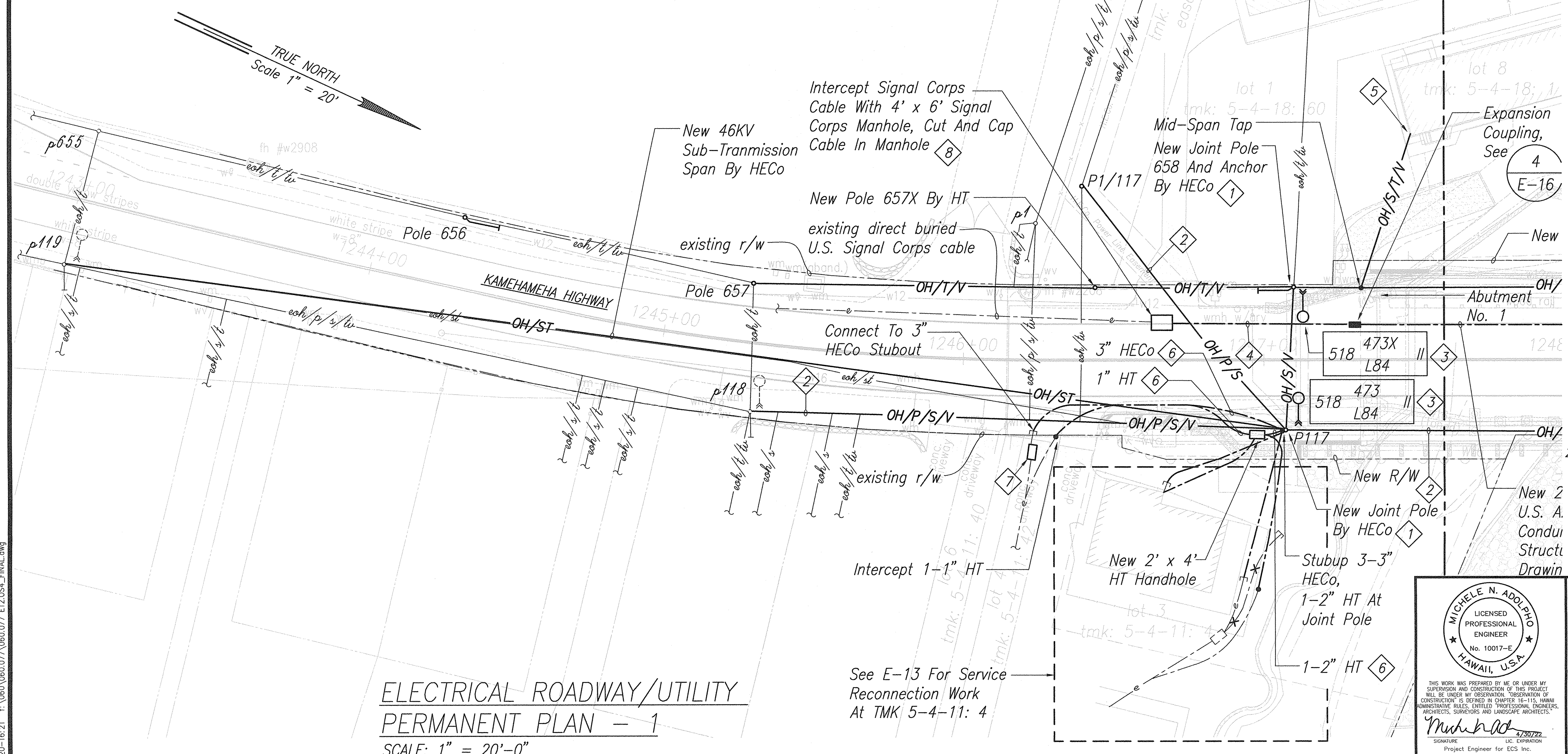
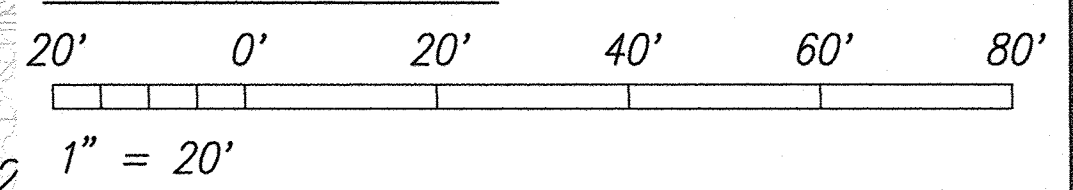
Hawaiian Electric Company's review shall in no way relieve Vendor/Contractor from responsibility for engineering, design, workmanship, material, performance of equipment and material, and any other liability under contract or by law.

APPROVED

Steph J... 12/15/20
Hawaiian Telcom Date

Dani Tam... 12/28/2020
Spectrum Date

GRAPHIC SCALE



**ELECTRICAL ROADWAY/UTILITY
PERMANENT PLAN - 1**
SCALE: 1" = 20'-0"

| | |
|-------------------|------|
| ORIGINAL PLAN | DATE |
| NO. | |
| SURVEY PLOTTED BY | EST |
| DRAWN BY | WC |
| TRACED BY | |
| QUANTITIES BY | |
| CHECKED BY | |

Michele N. Adolpho
LICENSED PROFESSIONAL ENGINEER
No. 10017-E
HAWAII, U.S.A.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

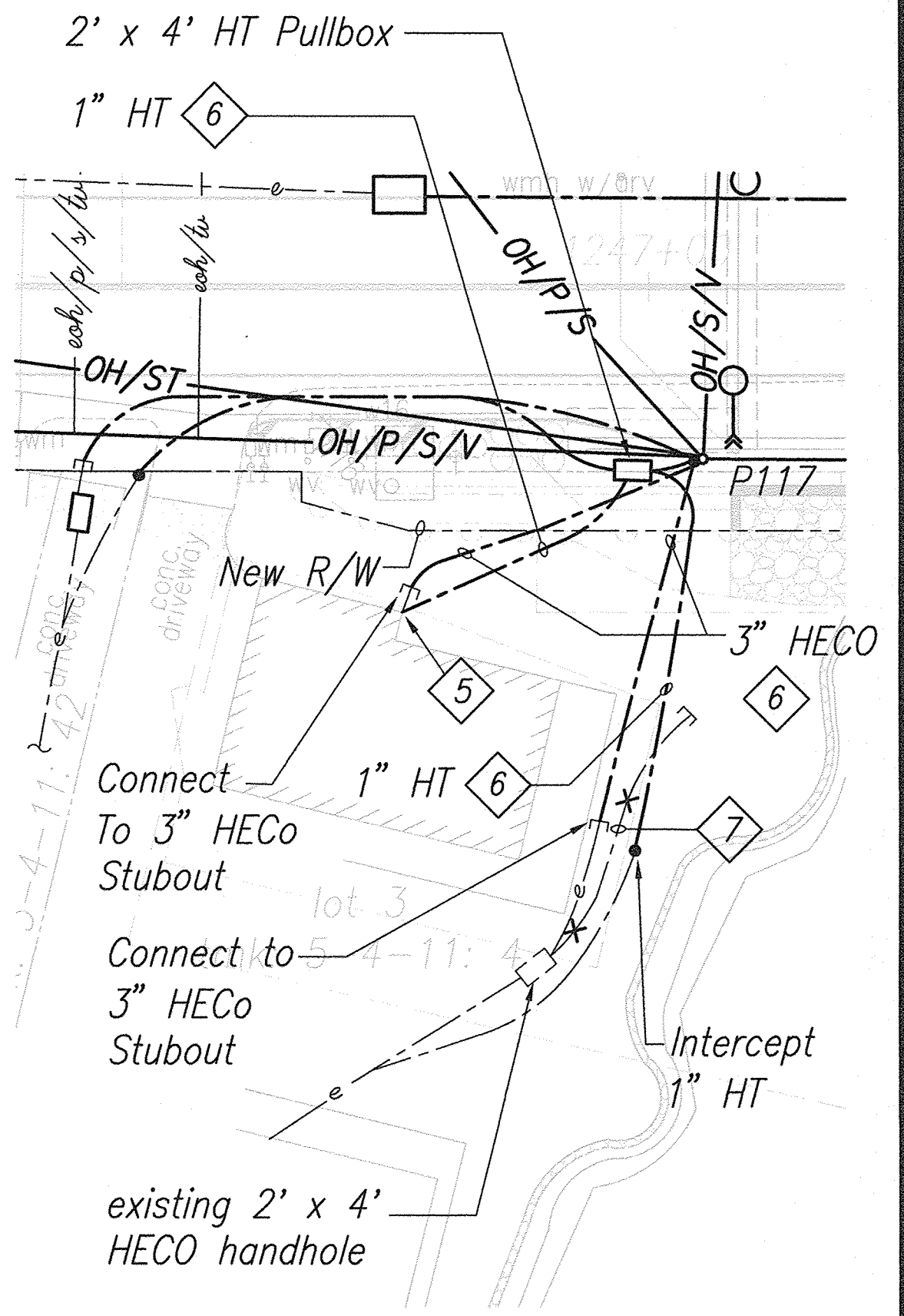
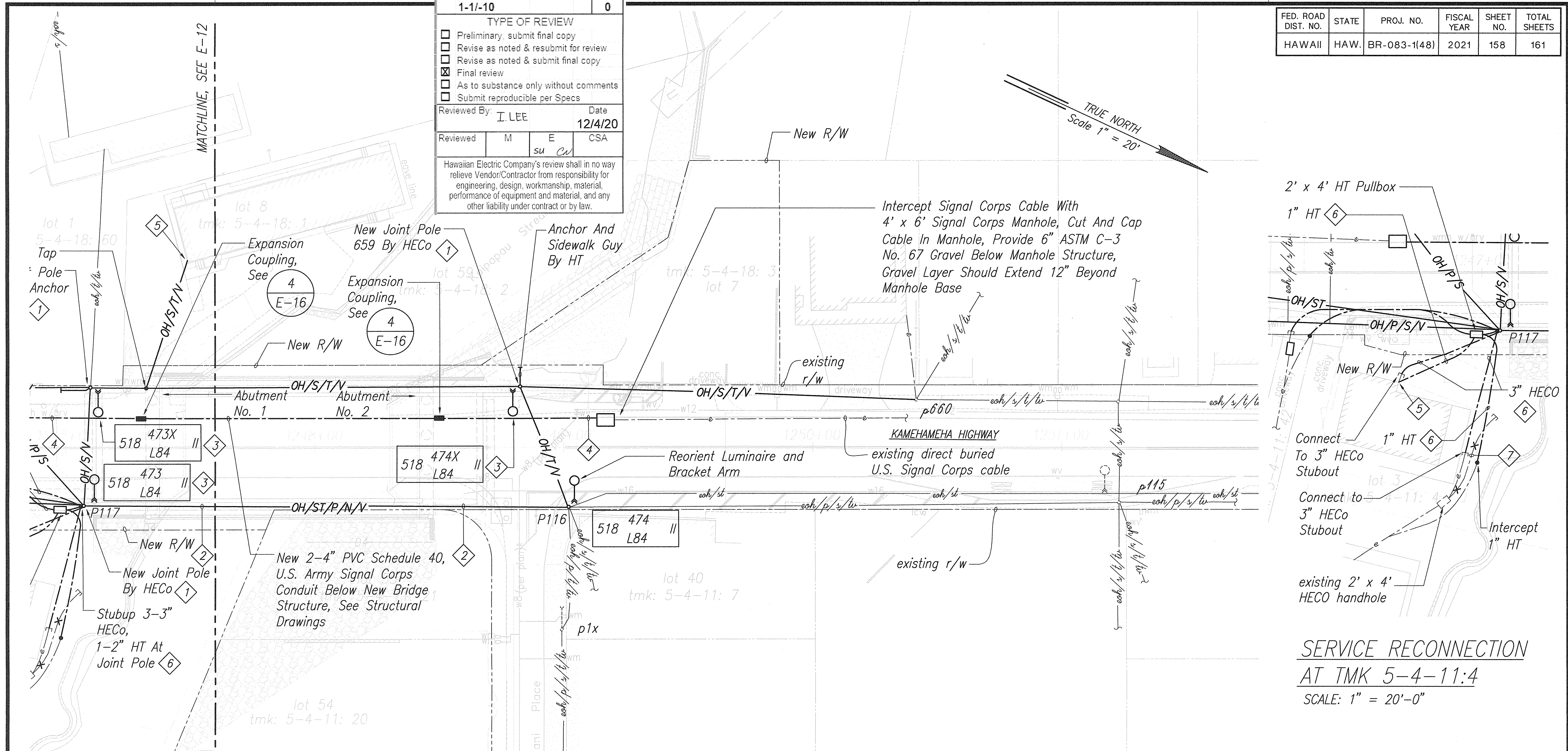
**ELECTRICAL ROADWAY/UTILITY
PERMANENT PLAN - 1**

Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

Scale: As Noted Date: November 2020

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| ENGINEERING DEPT. | |
| HECO DWG. or P.O. NO. | REV. |
| 1-1-10 | 0 |
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| <input checked="" type="checkbox"/> | Final review |
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| <input type="checkbox"/> | Submit reproducible per Specs |
| Reviewed By: | I. LEE |
| Date: | 12/4/20 |
| Reviewed | M E CSA |
| | SU CU |
| Hawaiian Electric Company's review shall in no way relieve Vendor/Contractor from responsibility for engineering, design, workmanship, material, performance of equipment and material, and any other liability under contract or by law. | |

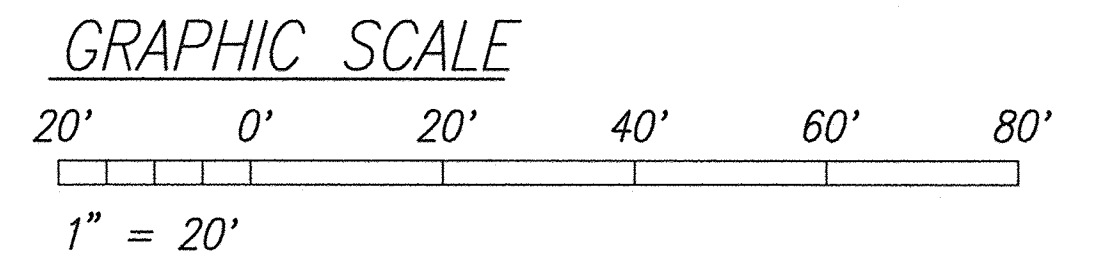
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|---------------------|-------|--------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 158 | 161 |



NOTES:

- 1 Permanent Utility Pole, By Utility Companies, After Construction Of Bridge Replacement.
- 2 Relocated Or Adjusted Overhead Conductors By Utility Companies, After Construction Of Bridge Replacement.
- 3 New Unmetered LED Street Lighting Luminaire And Bracket Arm Mounted On Joint Pole, See (1) E-14
- 4 2-4" PVC Schedule 40, Concrete Encased Signal Corps Ductline, See (2) E-1
- 5 Permanent Utility Service Connection. Coordinate With The Respective Utility Companies.
- 6 For Typical Duct Section, See (1) E-1
- 7 Remove Ductline After HECO Removes Cables In Duct.

ELECTRICAL ROADWAY/UTILITY PERMANENT PLAN - 2
SCALE: 1" = 20'-0"

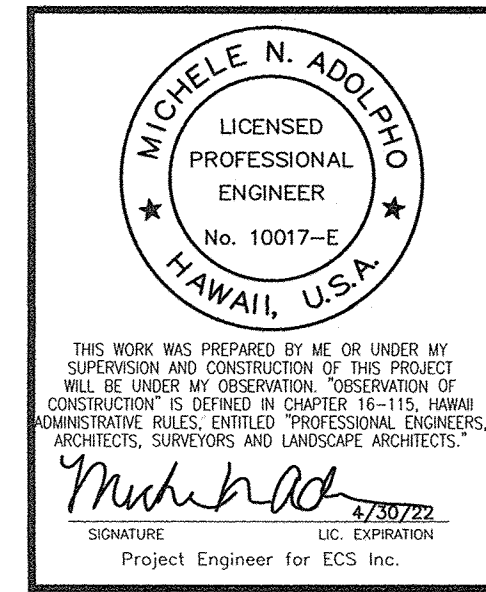


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| CHECKED BY | _____ |
| IN CHARGE BY | _____ |
| QUANTITIES BY | _____ |
| NO. | _____ |

12/2/20-16-22 Y:\060\060\077\060\077 E13.054_FINAL.dwg

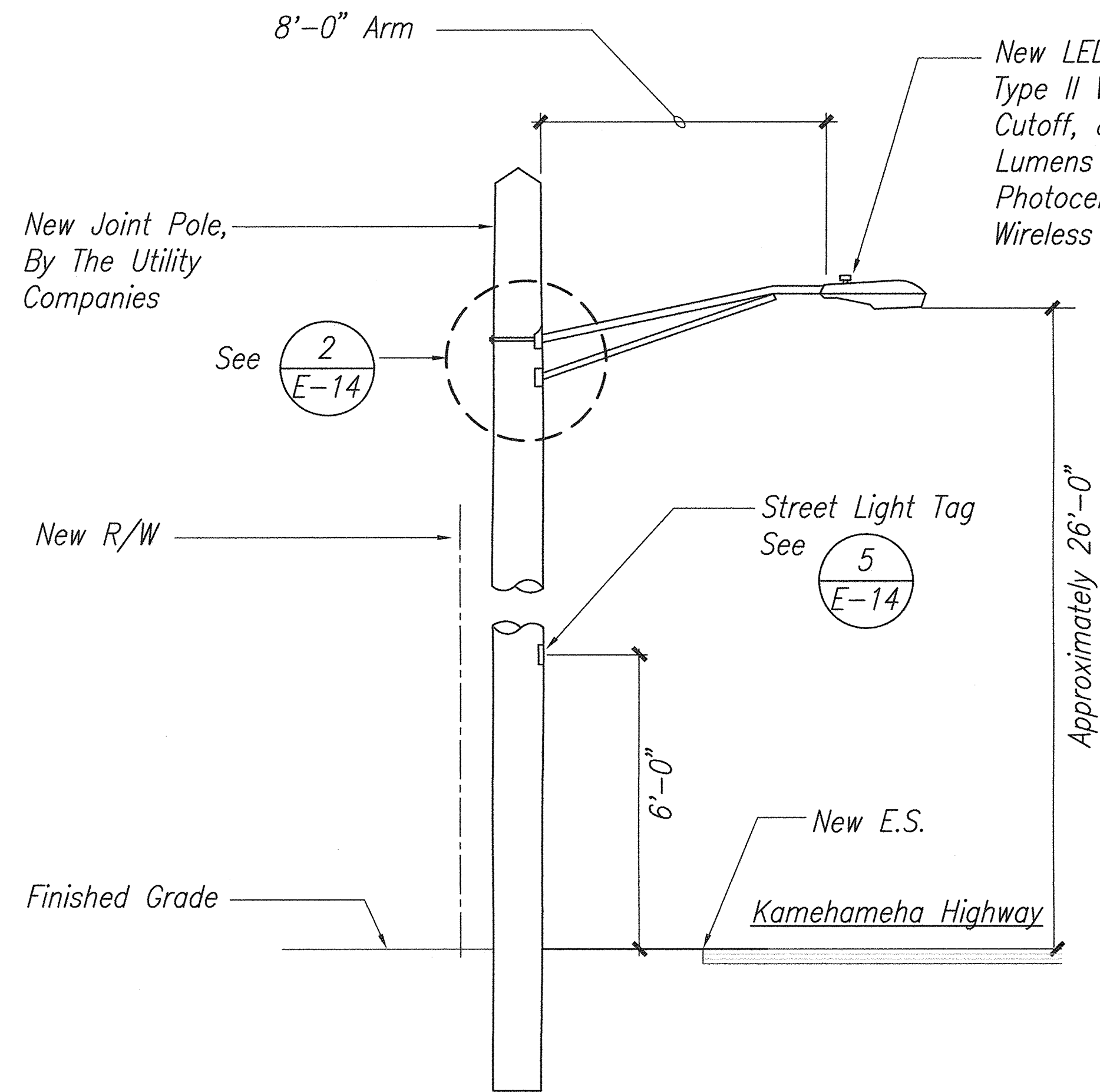
RMTC JOB NO. : 1-19548-0E

APPROVED
Stephen J. Davis 12/15/20
 Hawaiian Telcom Date
Dawn Tamura 12/28/2020
 Spectrum Date

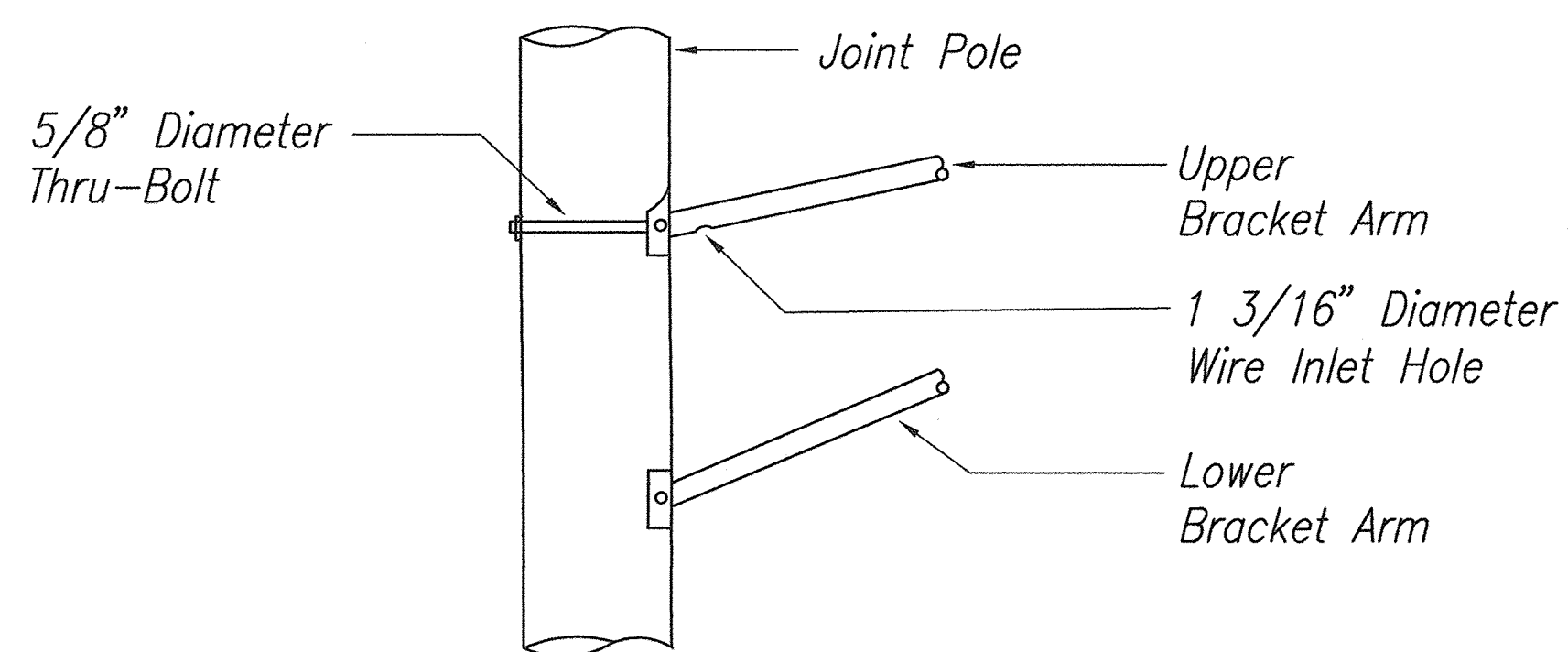


STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
ELECTRICAL ROADWAY/UTILITY PERMANENT PLAN - 2
 Kamehameha Highway
 Kaipapau Stream Bridge Replacement
 Federal Aid Project No. BR-083-1(48)
 Scale: As Noted Date: November 2020

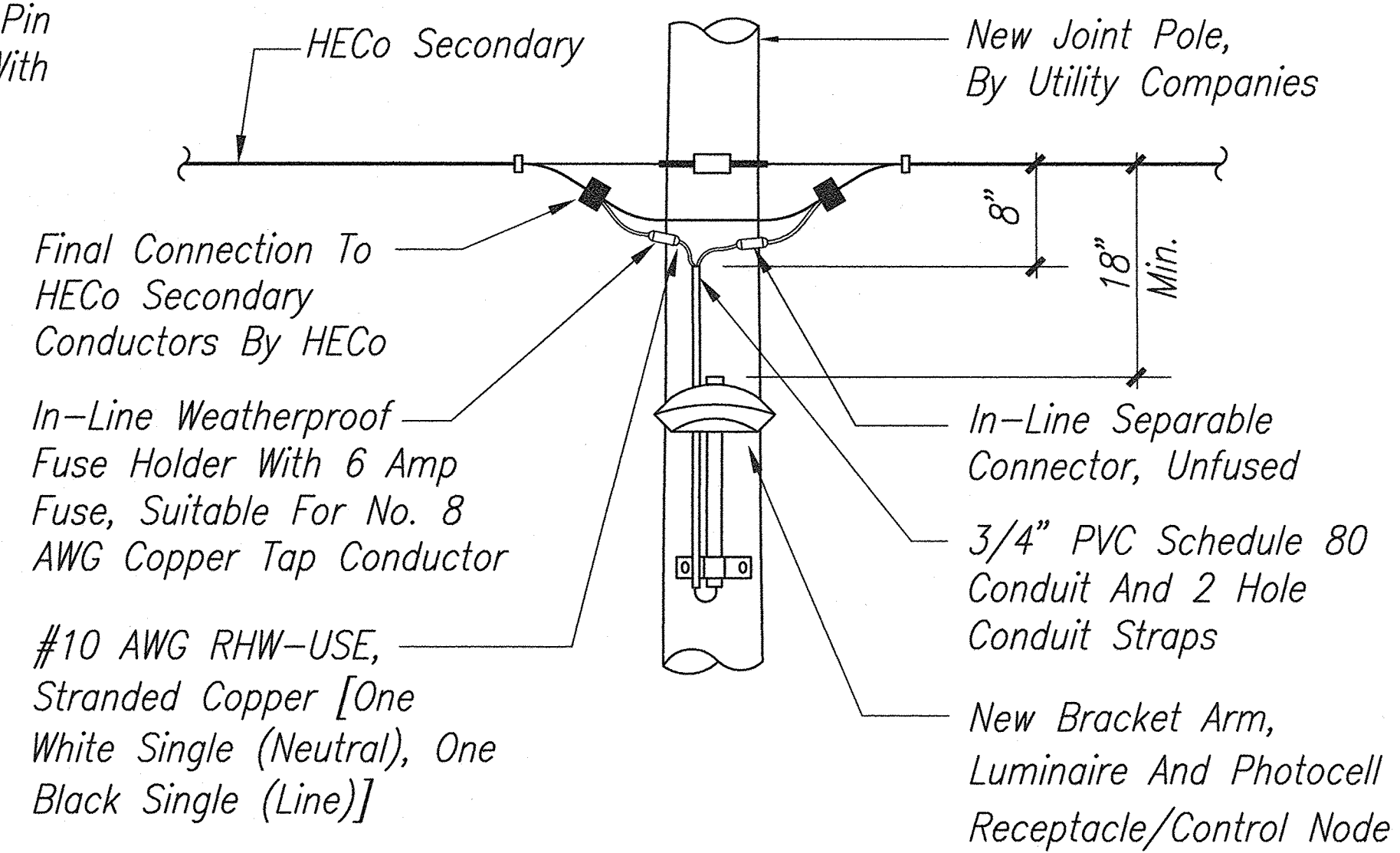
| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 159 | 161 |



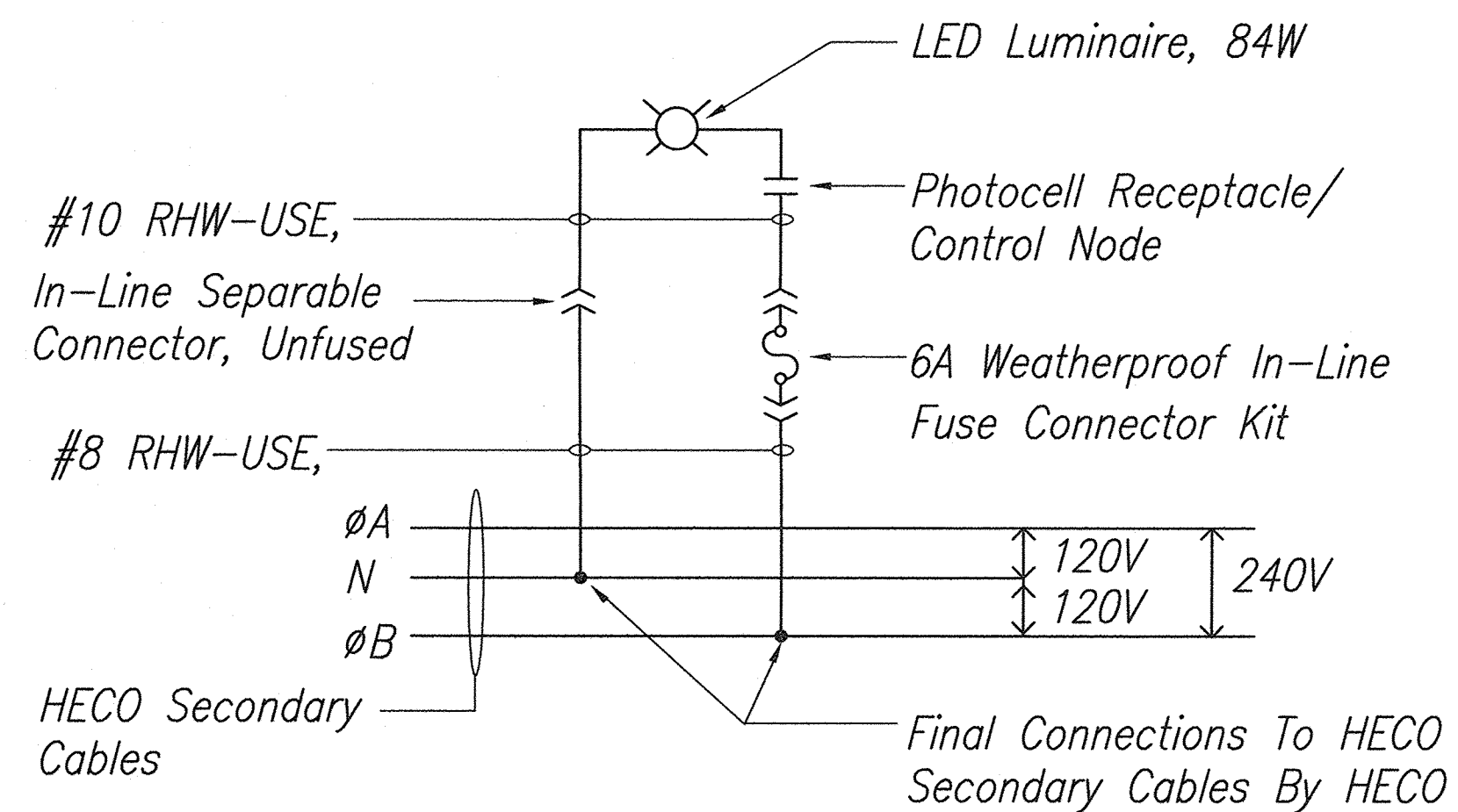
1 STREET LIGHT/WOOD POLE DETAIL
E-14 Not To Scale



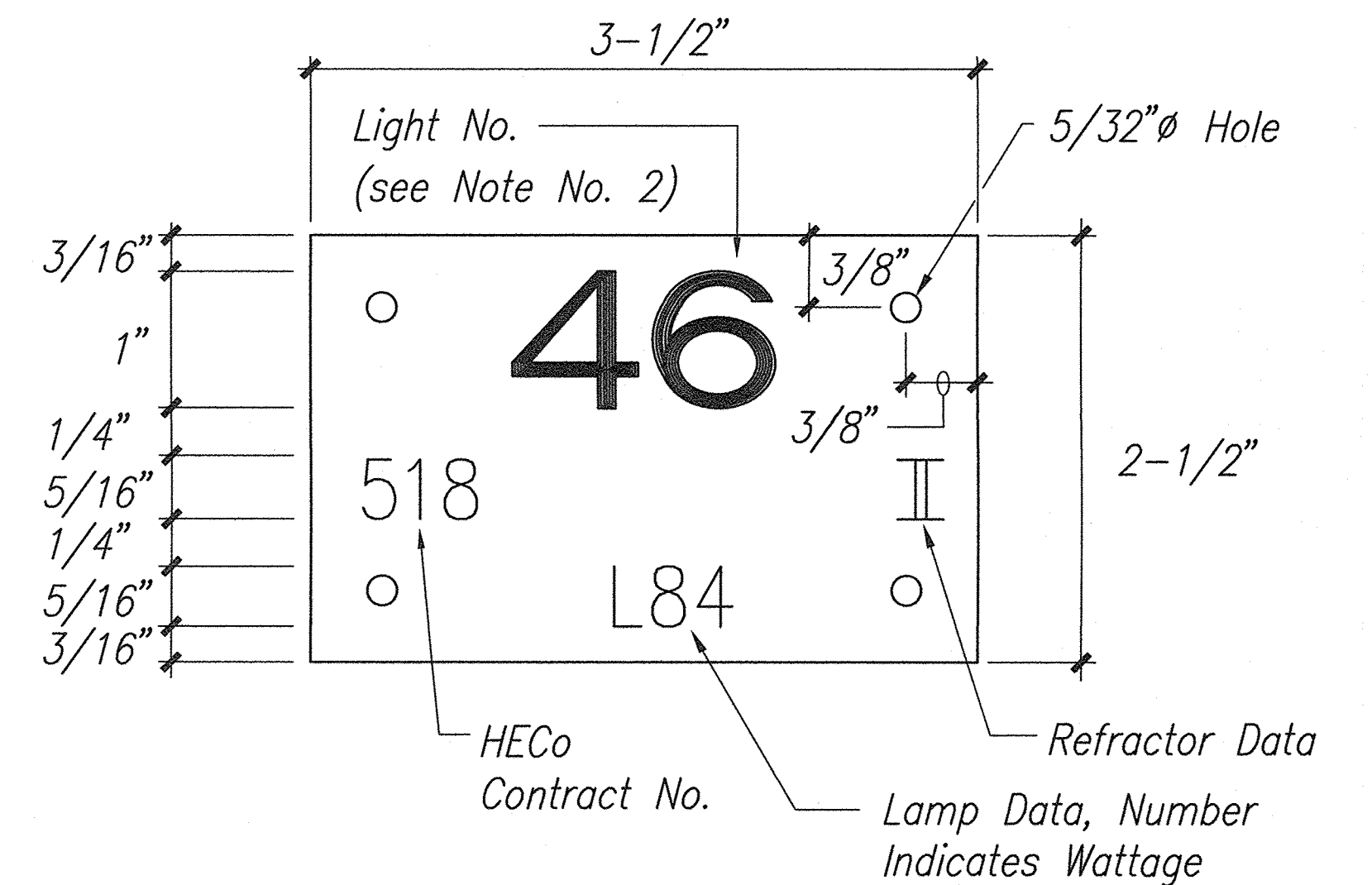
2 BRACKET ARM MOUNTING DETAIL
E-14 Not To Scale



3 STREET LIGHT ON JOINT POLE
E-14 Not To Scale



4 STREET LIGHT ON JOINT POLE WIRING DIAGRAM
E-14 Not To Scale



NOTES:

- Use 3-Ply Laminated Flexible Plastic Black-White-Black Thickness; Black Cap Sheet-0.010", White Base Sheet-0.052", Black Base Sheet-0.010".
- Light Number Size Shall Be 1" High And Engraved 1/8" Wide, White In Color. Obtain Light Numbers From The State.
- Nomenclature Size Shall Be 5/16" High And Engraved 1/32" Wide, White In Color (HECO Contract Number, Lamp Data And Refractor Data As Required).
- Attach To Wood Poles With 4D Aluminum Nails.
- Numbers Are Inscribed By Cutting Through "Black Cap Sheet" To Expose "White Letters".

5 STREET LIGHT TAG
E-14 Not To Scale

| | |
|---------------|------|
| ORIGINAL PLAN | DATE |
| DESIGNED BY | REV |
| DESIGNED BY | TC |
| QUANTITIES BY | |
| CHECKED BY | |
| No. | |

11/16/20-16-19 X:\060\060.07\060.077 E-14.DWG

Kaipapau Utility Relocation
46/12kV Overhead

HAWAIIAN ELECTRIC CO., INC.
ENGINEERING DEPT.

HECO DWG. or P.O. NO. 1-1-11 REV. 0

TYPE OF REVIEW

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Reviewed By: I. LEE Date: 12/4/20

Reviewed: M E CSA

Hawaiian Electric Company's review shall in no way

MICHELE N. ADDIPRO
LICENSED PROFESSIONAL ENGINEER
No. 10017-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. OBSERVATION OF CONSTRUCTION IS DEFINED IN CHAPTER 10-115, HAWAII ADMINISTRATIVE RULES, ENTITLED "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS."

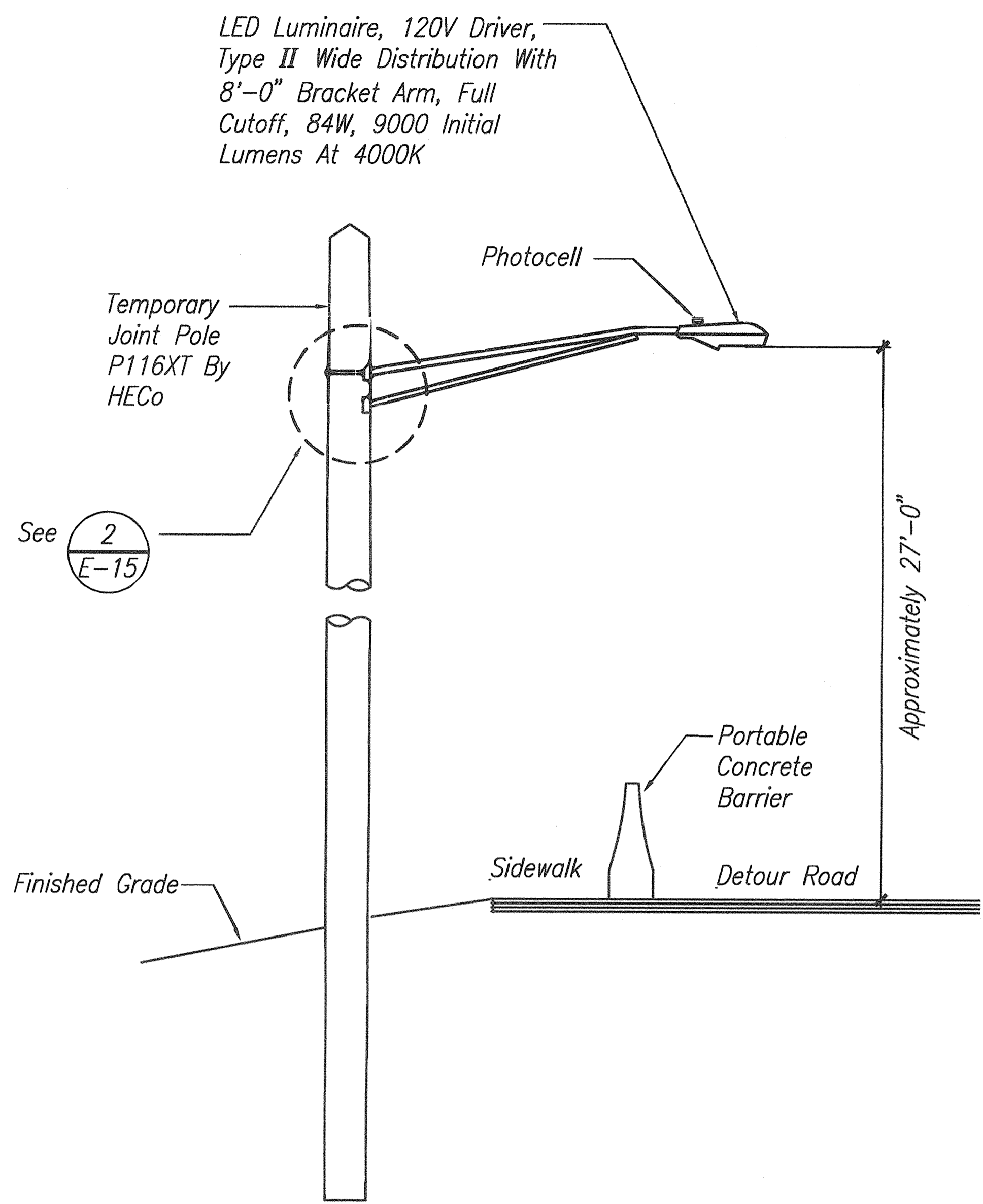
Signature: Michele N. Addipro
Project Engineer for ECS Inc.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
HIGHWAY LIGHTING
DETAILS
Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

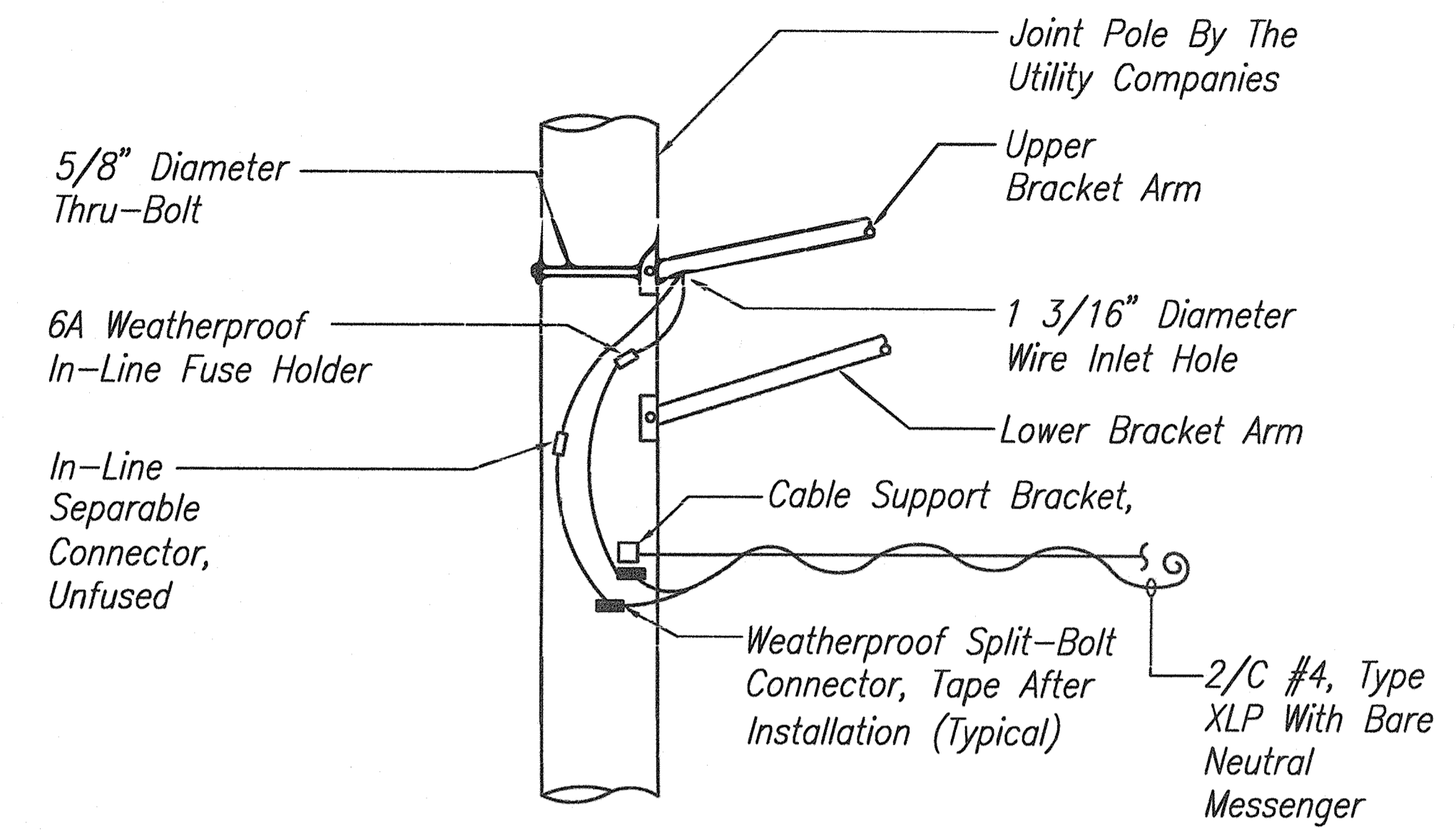
Scale: As Noted Date: November 2020

SHEET No. E-14 OF 16 SHEETS

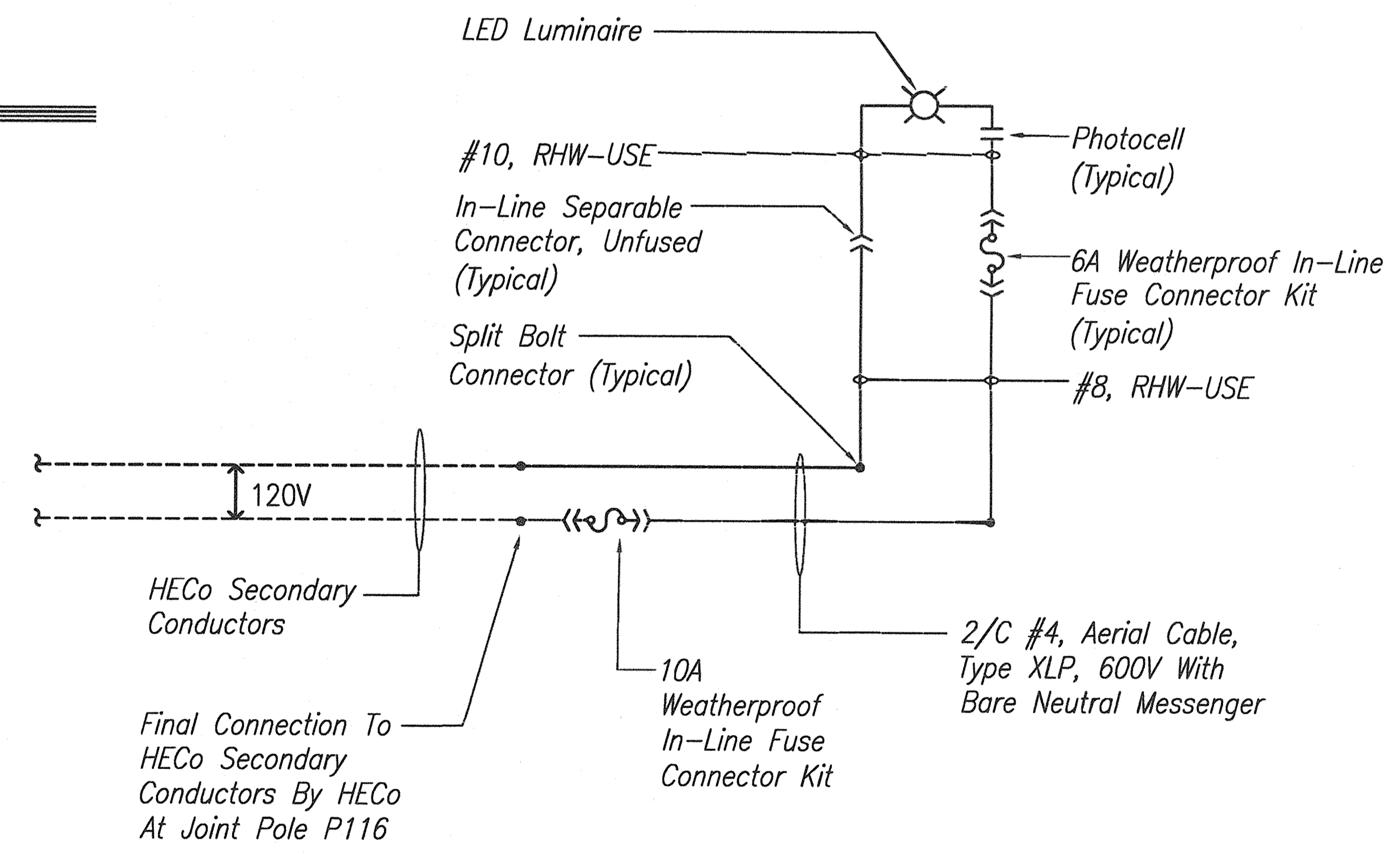
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|---------------------|-------|--------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | BR-083-1(48) | 2021 | 160 | 161 |



1 DETOUR ROAD LIGHT DETAIL (POLE 116XT) E-15 Not To Scale



2 DETOUR ROAD LUMINAIRE CONNECTION DETAIL AT JOINT POLE P116XT E-15 Not To Scale



3 DETOUR ROAD LUMINAIRE AT JOINT POLE P116XT WIRING DIAGRAM E-15 Not To Scale

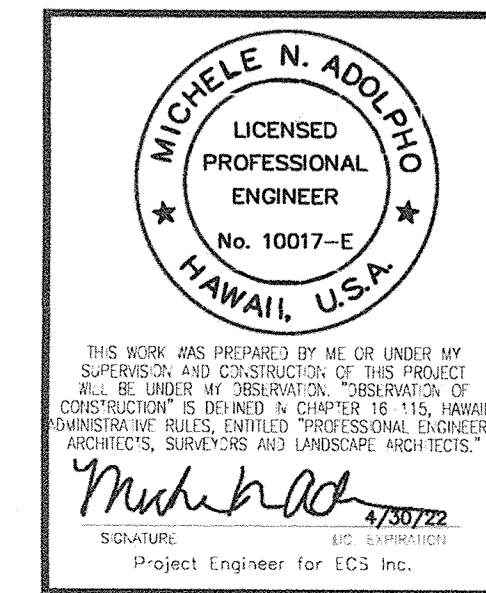
Kaipapau Utility Relocation
46/12kV Overhead
 HAWAIIAN ELECTRIC CO., INC.
 ENGINEERING DEPT.
 HECO DWG. or P.O. NO. REV.
1-11-12 **0**

TYPE OF REVIEW
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 Reviewed M E CSA

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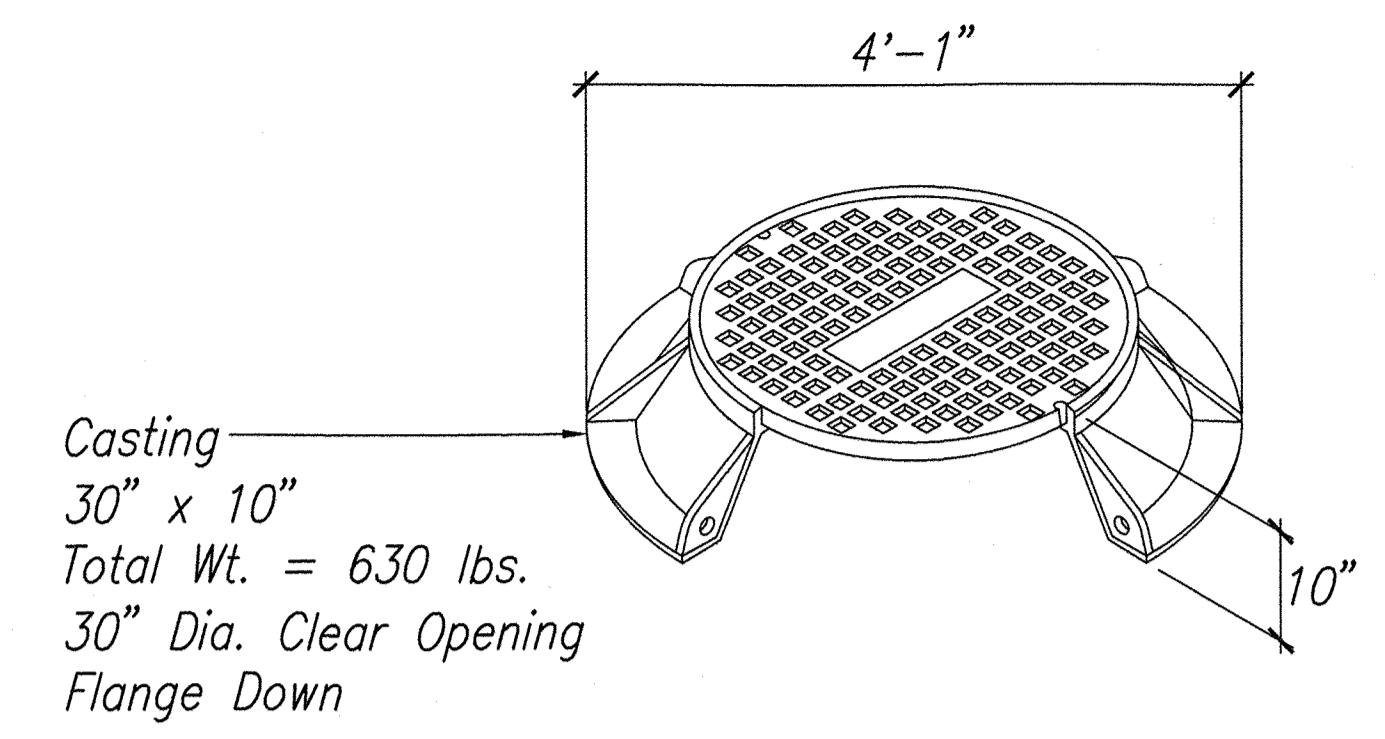
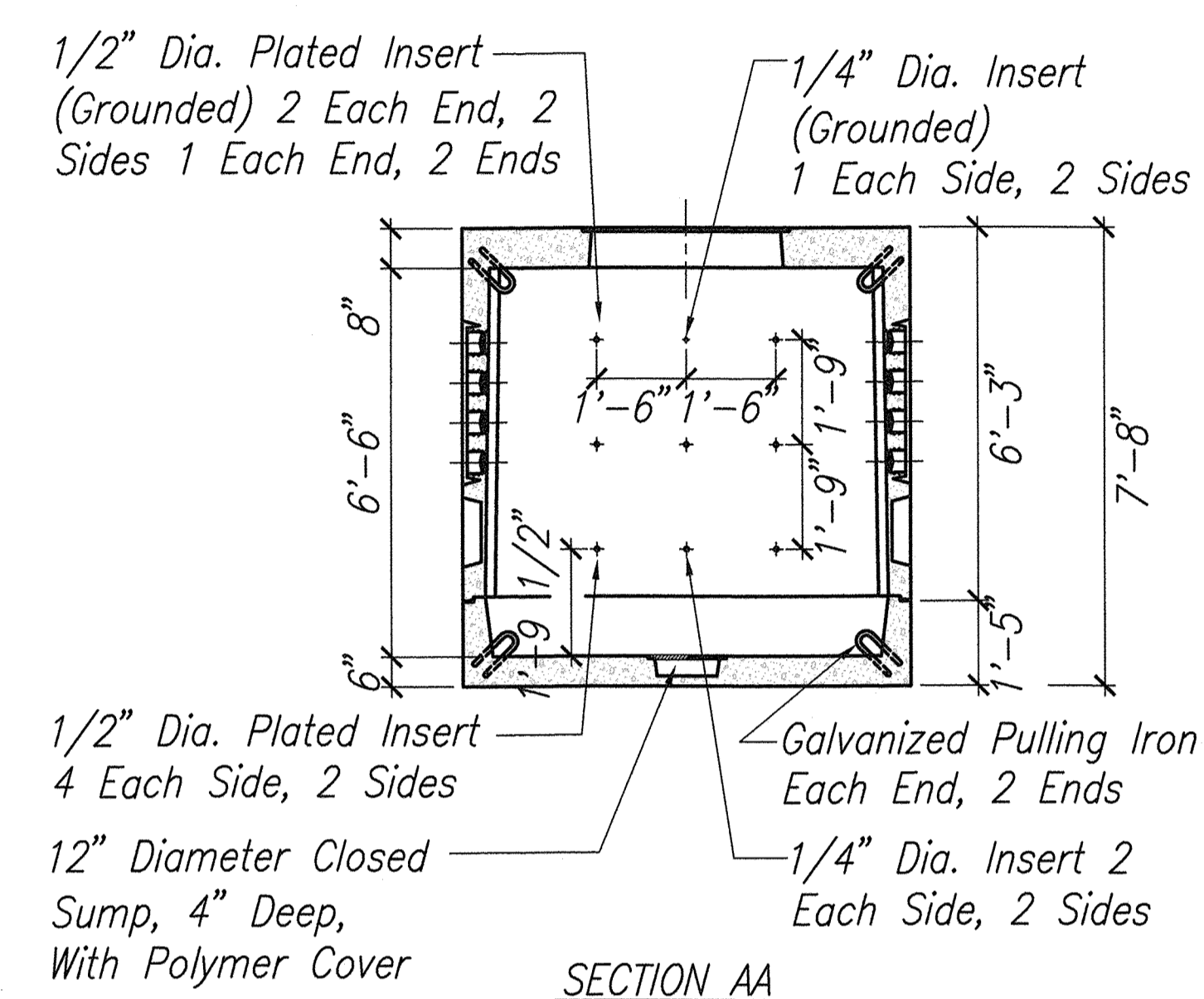
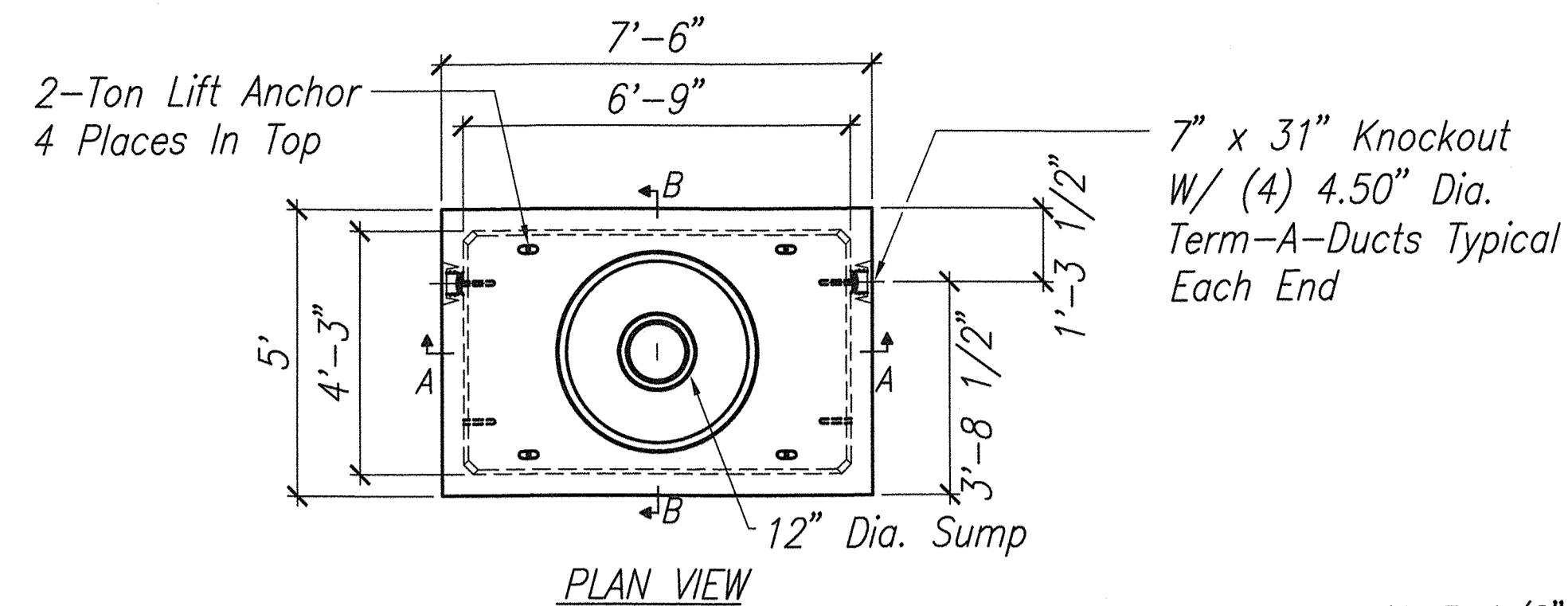
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| ORIGINAL PLAN | DATE |
| REVISION | DATE |
| REVISION | DATE |
| REVISION | DATE |
| REVISION | DATE |

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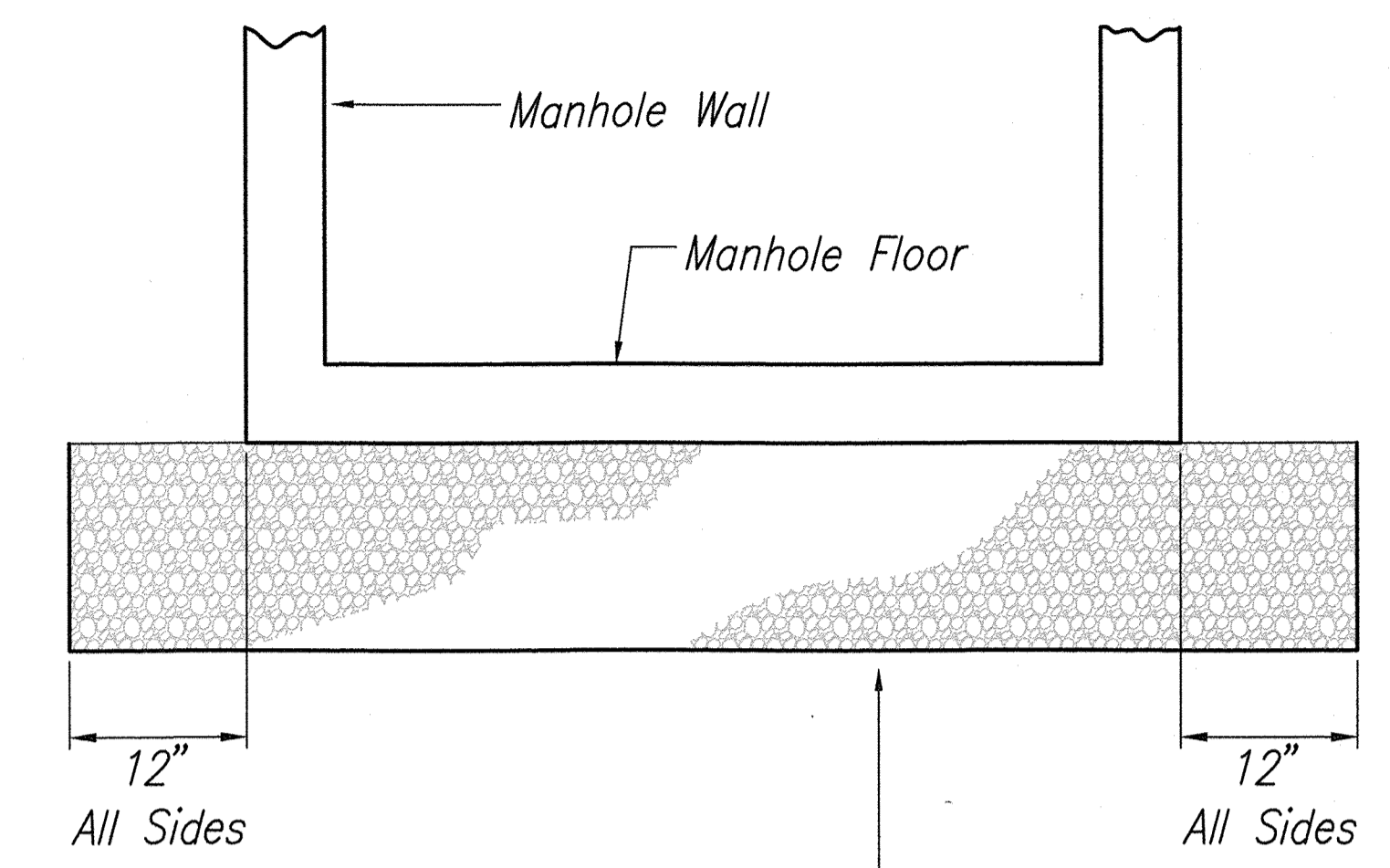
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
DETOUR ROAD
LIGHTING DETAILS
 Kamehameha Highway
 Kaipapau Stream Bridge Replacement
 Federal Aid Project No. BR-083-1(48)
 Scale: As Noted Date: November 2020

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-083-1(48) | 2021 | 161 | 161 |



- NOTES:**
- Manhole Covers Shall Be Labeled "US ARMY SIGNAL CORPS".
 - See Structural Drawing S0.4 Entitled "Structural General Notes," Notes 1, 2 And 3 For General Specifications; Design Specifications And Loads For Manhole; Manhole Cover And Manhole Frame Design Criteria.

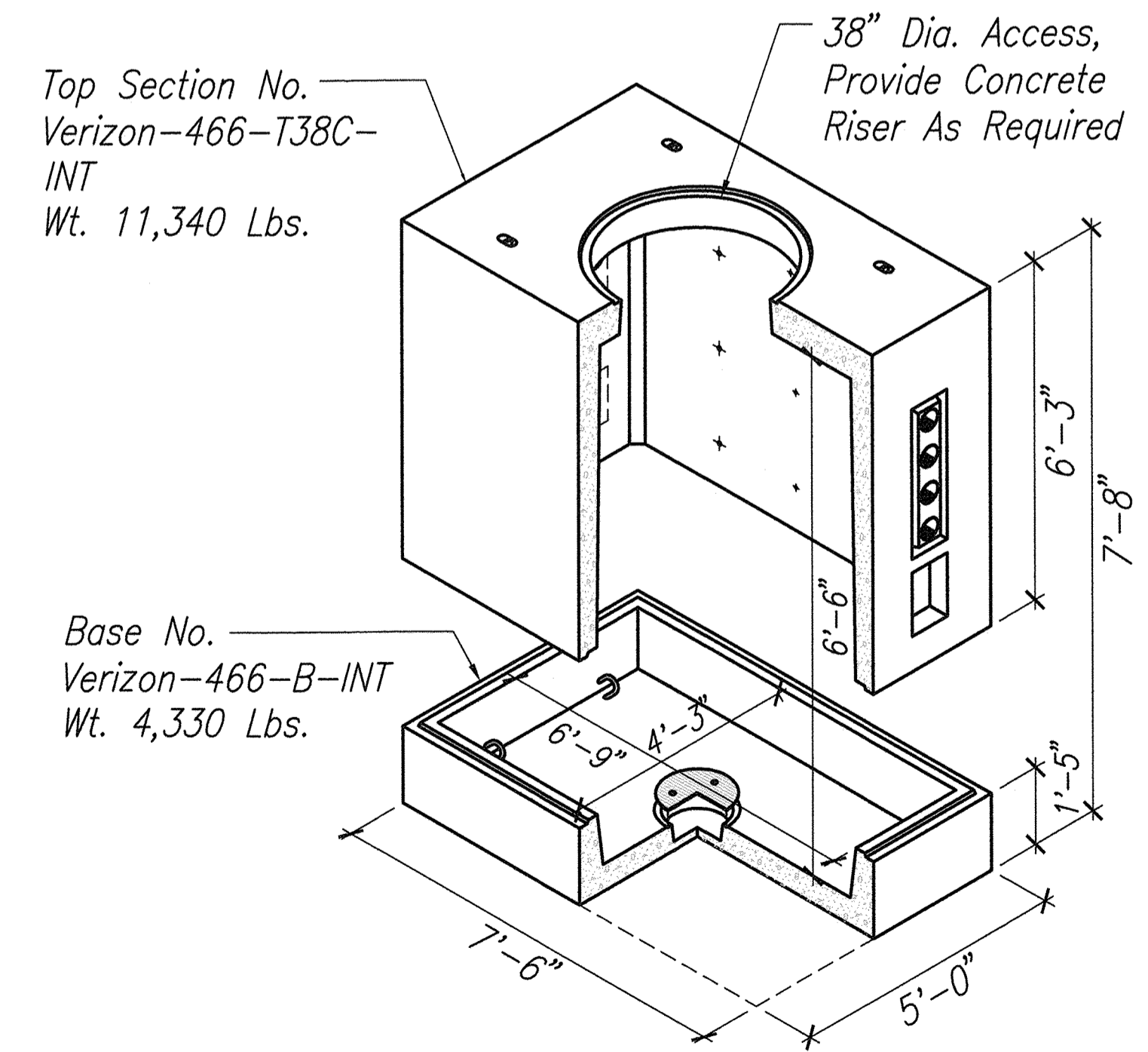
2 SIGNAL CORPS MANHOLE FRAME & COVER
E-16 Not To Scale



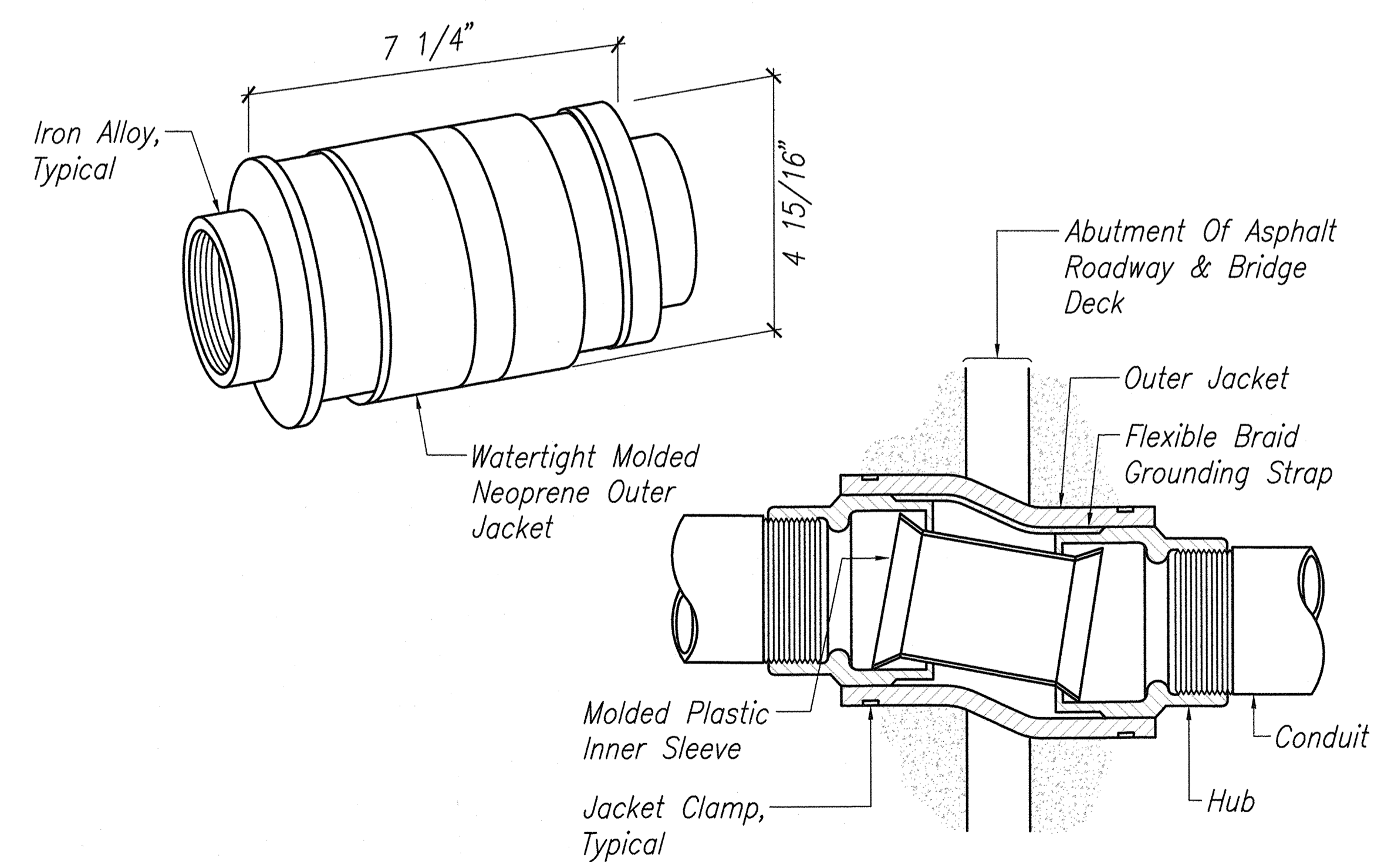
3 MANHOLE STABILIZATION LAYER
E-16 Not To Scale

EXPANSION COUPLING NOTES:

- Coupling Shall Be Suitable For Use While Embedded In Concrete.
- Coupling Shall Accomodate The Following Range Of Movement Without Collapsing Or Fracturing The Conduit:
 - Axial Expansion Or Contraction Up To 3/4".
 - Angular Misalignment Of The Axes Of The Coupled Conduits In Any Direction To 30 Degrees.
 - Parallel Misalignment Of The Axes Of The Coupled Conduits In Any Direction To 3/4".
- Provide Adapters For Use Of PVC Conduit As Required.



1 4' x 6' SIGNAL CORPS MANHOLE
E-16 Not To Scale



4 TYPICAL EXPANSION/DEFLECTION COUPLING DETAIL
E-16 Not To Scale

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|-------------------|------|
| SURVEY PLOTTED BY | DATE |
| DRAWN BY | BY |
| TRACED BY | MC |
| QUANTITIES BY | |
| CHECKED BY | |
| ORIGINAL PLAN | |
| NOTE BOOK | |
| No. | |

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Michele N. Adolpho
SIGNATURE
Project Engineer for ECS Inc.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SIGNAL CORPS MANHOLE

DETAILS

Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

Scale: As Noted Date: November 2020